

## 2019-2020 BIOMEDDC 4A15, BIOCHEM 4F09, 4T15 SENIOR RESEARCH THESIS – COURSE OUTLINE

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Welcome to your senior research thesis course! This course is an intensive two-term research project carried out under the supervision of a McMaster research investigator in the general area of the biochemistry and biomedical sciences. A fourth-year capstone course, the thesis is a self-directed learning experience in a cutting edge, research environment for biomedical research. Students will take initiative to practice effective time management, communication and professionalism in order to be successful. Students will plan and execute this learning experience with inputs from both the scientific literature and their research environment and will communicate their findings in both written and oral form. Their lab supervisor(s) and co-workers will be very important resources. There will also be monthly tutorials with the course coordinators.

### COURSE COORDINATORS AND ACADEMIC ASSISTANTS

#### BIOMEDDC 4A15

Course Coordinator: Dr. Nancy McKenzie ([nmckenzie@mcmaster.ca](mailto:nmckenzie@mcmaster.ca); HSC 4H30B; x27335)  
Academic Assistant: Stacy Bernard ([bernas1@mcmaster.ca](mailto:bernas1@mcmaster.ca); HSC 4H30G; x26891)

#### BIOCHEM 4F09, 4T15

Course Coordinator: Dr. Felicia Vulcu ([vulcuf@mcmaster.ca](mailto:vulcuf@mcmaster.ca); HSC 4H43; x22838)  
Academic Assistant: Taylor Gauthier ([biochemistryadvisor@mcmaster.ca](mailto:biochemistryadvisor@mcmaster.ca); HSC 4H45; x22059)

There will be no set office hours as BDC and Biochemistry have open-door policies. We welcome you to drop by our offices or schedule a meeting in advance if you need to see us outside of the scheduled tutorial times.

**Please note that we will use the generic [bcthesis@mcmaster.ca](mailto:bcthesis@mcmaster.ca) e-mail for all thesis communication.**

### TUTORIALS

Though not mandatory, students are strongly encouraged to attend the tutorials (Friday, 11:30-12:20 pm; BSB B135). Any changes or updates to the tutorial schedule will be posted on A2L.

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|-------------|------------------------------------------------------------------------------------------------------------------------------------|
| Fri Sept 13 | Course overview and best practices for a successful thesis experience<br>Industry Preview/Career Fair Reflection (Due Wed. Oct. 2) |
| Fri Oct 4   | Review article (Due Wed. Oct 23)<br>Lab performance 1 evaluation (Due: Fri. Nov 1)                                                 |
| Fri Nov 22  | Term 1 touchpoint<br>Peer Idea Exchange – Best Practices                                                                           |

Fri Jan 17	Mid-year touchpoint Lab performance 2 evaluation (Due: Fri. Jan 31) Thesis presentation – preliminary discussion
Fri Feb 28	Thesis presentation (Presentation Symposium Wed. March 25) Draft presentation outline
Fri Mar 13	Thesis writing Q&A (Due: Draft March 23   Final Mon. April 6) Graduate Reflection (Due Wed. April 8) Peer Thesis Presentation Practice

## COURSE COMPONENTS / ASSESSMENT

### Initial Meeting Form, Safety Form(s) and Acknowledgement of Confidentiality Form

- Students will meet with their supervisor to complete the “Initial Meeting Form”. Students will also complete mandatory safety form(s) and an acknowledgement of confidentiality form. These forms (available on A2L) are to be submitted to the A2L assignment folder by the specified due date, or you will not be allowed to do laboratory work.

### Lab Performance and Progress (48%)

- Lab performance will be assessed three times throughout the course by the lab supervisor(s) and will include a discussion of this assessment. Students should aim to spend an average of approximately 20 hours per week, over two terms in the lab. Note: BIOCHEM 4F09 students should aim to spend approximately 12 hours per week, over two terms in the lab.
- Students should meet regularly with their supervisor/lab mentor to ensure that their project goals and course expectations are being met.
- All lab work is to be completed by Friday, March 27<sup>th</sup>
- **Students will be evaluated on the following criteria for Lab Performance 1 (4%):**
  - ❖ Criterion 1: Background knowledge specific to research project (/10)
  - ❖ Criterion 2: Laboratory work (wet or dry) (/10)
  - ❖ Criterion 3: Progress and incorporation of feedback (/10)
  - ❖ Criterion 4: Time management and commitment to research project (/10)
- **Students will be evaluated on the following criteria for Lab Performance 2 (14%):**
  - ❖ Criterion 1: Data analysis (/10)
  - ❖ Criterion 2: Laboratory work (wet or dry) (/10)
  - ❖ Criterion 3: Progress and incorporation of feedback (/10)
  - ❖ Criterion 4: Time management and commitment to research project (/10)
- **Students will be evaluated on the following criteria for Lab Performance 3 (30%):**
  - ❖ Criterion 1: Data analysis (/10)
  - ❖ Criterion 2: Laboratory work (wet or dry) (/10)
  - ❖ Criterion 3: Progress and self-reliance/ independence (/10)
  - ❖ Criterion 4: Time management and commitment to research project (/10)

### **Review article (10%)**

- Students will write a review article on their research field and connect the state-of-the-art in their research area with their efforts in the laboratory. Maximum 10-pages, double-spaced, Times New Roman 12-point font, 2 cm margins. Figures, tables and references do not count in the page limit and can be added at the end of the document.
- Prior to starting the review, be sure to read the following article: Pautasso, M. (2013). Ten Simple Rules for Writing a Literature Review. PLoS Computational Biology, 9(7), e1003149. Doi:10.1371/journal.pcbi.1003149.
- **The review article will be assessed on the following criteria:**
  - ❖ Criterion 1: Overall review of the literature (/10)
  - ❖ Criterion 2: Analysis of the literature in the context of the research project (/10)
  - ❖ Criterion 3: Quality of writing (/10)

### **Presentation (20%)**

- As part of the BDC thesis symposium event, Wednesday, March 25, 8:30 am-1:00 pm, students will deliver a 15-minute PowerPoint presentation summarizing their research efforts in the context of the field followed by a 5-minute question period.
- **Students will be evaluated by their supervisor and other thesis supervising faculty based on the following criteria:**
  - ❖ Criterion 1: Understanding of project (/10)
  - ❖ Criterion 2: Progress (/10)
  - ❖ Criterion 3: Data analysis organization and presentation style (/10)
  - ❖ Criterion 4: Answering questions (/2)
- Please note that the thesis presentations are closed sessions. Only evaluating faculty and the students presenting are invited to attend.

### **Written Thesis (20%)**

- Students will prepare a written thesis document that makes clear the relevant background, the problem that they are trying to solve, the progress made and analysis of results in the context of the research field. Maximum 20-pages, double-spaced, Times New Roman 12-point font, 2 cm margins. Figures, tables and references do not count in the page limit and can be added at the end of the document.
- Students will be required to submit a draft of their thesis March 23<sup>rd</sup>. The draft should be at least 50% complete and contain a detailed timeline for completion within an appendix.
- The thesis will be assessed on the following criteria:
  - ❖ Criterion 1: Understanding of the problem and relevant background information (/10)
  - ❖ Criterion 2: Experimental design/data (/10)
  - ❖ Criterion 3: Interpretation/analysis of results (/10)
  - ❖ Criterion 4: Overall impression (/10)

### **Career Fair Reflection (1%)**

- Students will be required to attend a Career Fair and write a 1-page reflection on their experience at the event. Formatting guidelines: double-spaced, Times New Roman 12-point font, 2 cm margins.
- **The reflection will be assessed by the course coordinator on a pass (1%) / fail (0%) basis.**
- BDC students will be required to attend and reflect on the September 27, BDC Career Fair.
- Biochemistry students will be required to attend and reflect on the September 19, Student Success Centre Career Fair.

## Networking and Future Directions Reflection (1%)

- Students will be required to attend a networking event and write a 1-page reflection on their experience and their future academic/career plan. Formatting guidelines: double-spaced, Times New Roman 12-point font, 2 cm margins.
- **The reflection will be assessed by the course coordinator on a pass (1%) / fail (0%) basis.**
- BDC students will be required to attend and reflect on the April 3, BDC Engage event. The reflection must include a critique of at least one Master's poster.

## DUE DATE SCHEDULE

COMPONENT	WEIGHTING	DUE DATE
<b>Initial Meeting Form</b> <b>Safety Training Form</b> <b>Confidentiality Form</b>	Course Requirement	Wednesday, September 18; 11:59 pm  Submitted directly to the A2L assignment folders
<b>Career Fair Reflection</b>  <b><u>Biochemistry Students</u></b> <b>Thursday, September 19</b> <b>10:00 am – 3:00 pm</b> <b>David Braley Athletic Centre</b>  <b><u>BDC Students</u></b> <b>Friday, September 27</b> <b>8:30 – 1:00 pm</b> <b>CIBC Hall</b>	1%	<b>Career Fair Reflection</b> Due Wednesday, October 2; 11:59 pm  Submitted directly to the A2L assignment folder
<b>Review Article</b>	10%	Wednesday, October 23; 11:59 pm  Submitted directly to supervisor and the A2L assignment folder
<b>Lab Performance Evaluation 1</b>	4%	Friday, November 1; 4:00 pm  Marking form submitted electronically <b>by the supervisor</b>

<p><b>Lab Performance Evaluation 2</b></p>	<p>14%</p>	<p>Friday, January 31; 4:00 pm</p> <p>Marking sheet submitted electronically <b>by the supervisor</b></p>
<p><b>Thesis Presentation Symposium (Concurrent sessions)</b>  <b>Wednesday, March 25</b>  <b>8:30 am - 1:00 pm</b>  <b>Rooms to be assigned</b></p>	<p>20%</p>	<p>Students will upload their presentation to the A2L assignment folder by 7:30 am. Students will also bring their PowerPoint presentation on a USB key at <b>8:30 am (session 1 presenters)</b> or <b>10:20 am (session 2 presenters)</b> to upload on the computer in their assigned room. Students should also e-mail themselves a pdf copy of their presentation as a backup measure.</p>
<p><b>Lab Performance Evaluation 3</b></p>	<p>30%</p>	<p>Friday, March 27; 4:00 pm</p> <p>Marking sheet submitted electronically <b>by the supervisor</b></p>
<p><b>Written Thesis</b></p>	<p>20%</p>	<p>Draft Thesis: Monday, March 23<sup>rd</sup>; 11:59 pm</p> <p>Submitted to the A2L assignment folder. Students should aim to have half their report written at this time and include a detailed timeline for completion.</p> <p>Final Thesis: Monday, April 6; 11:59 pm</p> <p>Submitted directly to supervisor and the A2L assignment folder</p>
<p><b>Networking and Future Directions Reflection</b></p> <p><b><u>Biochemistry Students</u></b>  <b>Networking event of their choosing</b></p> <p><b><u>BDC Students</u></b>  <b>BDC Engage</b>  <b>Friday, April 3</b>  <b>9:30 - 12:30 pm</b>  <b>CIBC Hall</b></p>	<p>1%</p>	<p><b>Reflection</b>  Due Wednesday, April 8; 11:59 pm</p> <p>Submitted directly to the A2L assignment folder</p>

## MISSED/LATE WORK

**Late work will be subject to a grade reduction of 10% per day and will not be accepted after four days.** Late work is to be e-mailed directly to the supervisor and course coordinator, as the A2L assignment folder will be closed. (NOTE: the 10% reduction takes effect immediately following the deadline.)

**Inquires related to deadlines should be directed to the course coordinators. To ensure students are being held to the same academic standards, supervisors are not to grant extension deadlines.**

It is the student's responsibility to ensure that they have properly submitted their work to the A2L assignment folder by checking their A2L e-mail for a submission receipt.

If you are absent from the university for a minor medical reason, lasting fewer than 3 days, you may report your absence, once per term, without documentation, using the **McMaster Student Absence Form (MSAF)** if the work is less than 25% of the course grade. Absences for a longer duration or for other reasons must be reported to the BDC Program Office. Students will be required to complete and submit the "BDC Petition for Relief for Missed Course Work Form" along with supporting documentation to the BDC Program Office. Missed work forms can be downloaded from the A2L "BDC Policy and Forms" course.

Once proper documentation is provided, the course coordinator will determine the appropriate accommodation.

## USE OF AVENUE2LEARN

In this course we will be using Avenue2Learn (<http://avenue.mcmaster.ca>). Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names 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.

## 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.

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.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the **Academic Integrity Policy**, located at [www.mcmaster.ca/academicintegrity](http://www.mcmaster.ca/academicintegrity).

The following illustrates only three forms of academic dishonesty:

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

## **ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES**

Students with disabilities who require academic accommodation must contact **Student Accessibility Services (SAS)** to make arrangements with a Program Coordinator. **Student Accessibility Services** can be contacted by phone 905-525-9140 ext. 28652 or e-mail [sas@mcmaster.ca](mailto:sas@mcmaster.ca). For further information, consult McMaster University's *Academic Accommodation of Students with Disabilities* policy.

## **ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)**

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students requiring a RISO accommodation 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 their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

## **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.