**MCDB 595 – Intensive Research in MCDB for BS/MS Candidates**

**MCDB 595 Student Contract**

As a student conducting year-long independent research for Yale College course credit and the BS/MS Senior requirement, I agree to the following:

* I am expected to devote an average of 20 hr/week to this research. I am aware that failure to do so will result in withdrawal from the Masters program.
* I will make every effort to attend my research mentor’s laboratory meetings.
* I will attend 2 of the student MCDB Oral Presentation sessions in the Fall term. I understand that failure to do so will result in a half letter grade reduction.
* I will make every effort to schedule my oral presentation at the time that fits with my mentor’s schedule.

Name: ­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Please Print)

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­  Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­ Class \_\_\_\_\_\_\_\_\_\_\_

Email Address: ­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Research Mentor: ­­­­­­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Please Print)

Committee Member: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Committee Member: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Committee Member: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Title for Research: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Please return this form to the Office of the Director of Undergraduate Studies:*

 *1220 KBT,* *crystal.adamchek@yale.edu**.*

Due dates: Committee Meetings: Fall and Spring

Oral Presentations meet in KBT 1202 in Fall: TBD Oral Presentations meet in KBT 1202 typically from 4:00 – 6:00 pm or 6:00 – 8:00 pm over several evenings in early December.

Poster: Mid-April (TBD)

Thesis due to committee at least one week before Thesis defense

Thesis defense (schedule and defend before last day of Classes)

**Guidelines for MCDB 595**

**For 595:**

**Research:** Students are expected to devote 20 hrs/week to their research.

**MCDB Oral Presentations - FALL only for MCDB 595 students** These should be uploaded to the Canvas Assignment section at least 2 days before the scheduled presentation. Don’t forget to include your 2-3 questions for the group.

Each student will make an oral presentation to a small group of students. Following a 10 minute presentation, students are expected to pose 2 or 3 questions to the group for discussion. There will be approximately 6 students presenting at each of the sessions. Students must present at one session and attend one additional small group session as a member of the audience.

Attendance will be taken. Failure to attend the 2 sessions will result in a loss of a half grade (*e.g.* a recommended A- will be lowered to a B+). All presentations will be held in early December in KBT 1202; typically, from 4 – 6:00 pm or 6:00 -8 pm over several evenings.

All students taking MCDB 595 for Senior Requirement are expected to attend a minimum of 2 MCDB Oral Presentation sessions, *(i.e., you will present at one session and attend 1 additional session for a total of 2 sessions)*. Signups will be handled through the Canvas site. All students should try to find a mutually agreeable time with their Research Mentors for their MCDB Oral Presentations.  We have tried to be as flexible as possible in making these arrangements.  Students will be expected to adhere to the time schedule as noted on Canvas. Each student must have a verified time slot for his/her presentation. Failure to attend both sessions will result in a loss of a half grade (*e.g.* a recommended A- will be lowered to a B+).

These presentations should be made using Powerpoint. We will have a digital projector available; however, you should plan on bringing your own laptop to plug into the system. Talks are 10 minutes followed by 3-5 minutes for discussion/questions. Time and presentation order will be enforced.

After each talk, the audience will be allowed to ask questions, and then the speaker will be expected to ask 2 or 3 questions of the audience. A portion of your course grade will be based in part on participation in these sessions.

Individual slides should be simple and not overloaded with text. Many skilled presenters find it effective to present only one key idea on each slide, as a general rule, and to provide a title on each slide. Your talk should include an introduction of the overarching biological question that you addressed, an explanation of the approach you took to tackle this question, your results, and the conclusions. Your objective should be to make your presentation clear and interesting to individuals who do not share your research background. It is extremely important to define any technical terms and to avoid acronyms. You should assume that the audience does not know the terminology or background of your field.

Practice your talk. Give a practice talk to the lab you are working in before you give it to the class. As noted in the Research Mentor’s contract, his/her attendance at the session at which you are presenting is expected; if she/he cannot attend, you should arrange for someone else from your lab to attend. Mentor participation is a critical aspect of the course. Consequently, consult your research mentor at the beginning of the term to select a date that fits with her/his schedule.

**Poster:** Students should present a poster for the research symposium in April.

The Poster Symposium will be held Mid April from 2-4pm – location to be determined. The purpose of the symposium is to share information and more specifically to highlight undergraduate research at Yale. Refreshments will be provided courtesy of the MCDB Dept. The symposium will be open to anyone wishing to attend, so please encourage friends, colleagues and other students to come. Your research mentor is strongly urged to attend.

**Each student must prepare a poster.** Posters can be as large as 3' X 5', but may be smaller. We will have poster boards and easels available to put your poster on. Posters may be printed professionally **(please note that there is no funding available for this expense from MCDB)**, or the student may print them on a color printer and assemble individual sheets onto the poster board at the poster session.

Posters should have a title, and the authors (including you and your research mentor) should be listed as well, usually in large letters at the top. Indicate which research course you are in (MCDB 495). The poster should include three sections: Introduction, Results, and Conclusions. The Introduction explains the purpose of your project; the Results section contains figures and/or tables showing your data, with legends or commentary; the Conclusion summarizes what you learned. Feel free also to include what you would do next were you to continue working on the project.

If you continue in research, the first presentation you are likely to give at a scientific meeting is a poster, so this will be good practice. The fewer words and the LARGER THEY ARE WRITTEN make it easier for people to notice and examine your poster. If a poster contains a great deal of text in small font, the audience may not read it. The same applies to data. Tables with large numbers of entries may be ignored. Simple figures with a concise conclusion for each are optimal. You should begin to organize your poster well in advance and you should allow at least one day for planning it and at least one day for producing the various parts of it. Bring it to the session ready to assemble. Please keep in mind that content should take precedence over form. It is much more important that your poster be clear, informative, and thoughtful than that it look highly professional. Aesthetic appeal is of course nice, but the science is paramount. Finally, **discuss your presentation with your colleagues and research mentor well before the session** and if you have any further questions/concerns bring the preliminary poster to show the instructor in charge.

**Committee Meetings:** Students are to schedule committee meetings in each of the two academic terms to discuss their thesis and research. The format of the meeting can be arranged by the research mentor. Students should notify the office of the DUS as to the date of the committee meetings. The student should complete the top portion of the attached Committee Meeting Form (attached) and provide to the Research Mentor for completion. The Research Mentor is expected to provide the completed form to the office of the DUS.

**Thesis Defense**: The student is expected to give an oral thesis defense to the committee, followed by a comprehensive examination of the thesis conducted by the thesis committee. Students should notify the office of the DUS as to the date of the thesis defense – and provide the attached form to the research mentor before the defense. The Research Mentor is expected to provide the completed form to the office of the DUS.

Written Thesis:

* + One chapter should be Introduction/Review of the field. Subsequent chapter(s) will discuss the student’s research and a thorough discussion of it.
	+ The length of the thesis should be 40-100 pages.
	+ Each committee member should receive a copy of the thesis at least one week prior to meeting with the

committee.

* + Additional guidelines for thesis should to be arranged in consultation with the student’s research mentor.
	+ There will be letter grades for each semester. The grade will be determined by the student’s faculty

committee.

**MCDB 595 Committee Meeting Form – Fall / Spring**

*(Circle Appropriate Semester)*

Student: ­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­­­­­­­­­­­ Date of Committee Meeting: \_\_\_\_\_\_\_\_\_\_\_\_

Thesis Advisor: ­\_\_­­­­­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Committee Member: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Committee Member: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Committee Member: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Research: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Proposal/Plan: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Please return this form to the Office of the DUS: 1220 KBT, via email:* *crystal.adamchek@yale.edu*

Copies to be provided to all Committee Members and Student from DUS office

***Proposed MCDB 595 Grade (Fall):*** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \*(letter grade) should reflect MCDB Oral Presentation, lab performance.*

Additional Factors for Grade Consideration by the Committee:

1. Progress made since last Committee meeting
2. Knowledge of scientific literature relevant to the research project
3. Thinking critically about research project
4. Demonstrating initiative and independence in experimental design and project directions
5. Motivation and work ethic
6. Technical competence at the bench, trouble-shooting ability
7. Quality and clarity of oral presentations

***Proposed MCDB 595 Grade (Spring):*** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \*(letter grade) should reflect MCDB Oral Presentation, Thesis Defense, written Thesis, Poster presentation and lab performance.*