Course Outline for

Biochemistry 4B06, Biochemistry 4F09, Biochemistry/Health Sciences 4R12
(2012-2013)

Course Coordinators:

Dr. Felicia Vulcu
Email: vulcu@mcmaster.ca
office location: HSC-4H43 (please go through HSC 4H45)
extension: 22838
Office hours: Please email me to set up an appointment

Dr. Ishac Nazi
Email: nazii@mcmaster.ca
office location: HSC-4H30F
extension: 20242
Office hours: Please email me to set up an appointment

WELCOME:

The overall goal of these courses is to introduce you to the rich scientific culture in the McMaster University Department of Biochemistry and Biomedical Sciences. Here you will develop numerous laboratory skills while being exposed to cutting-edge innovative research. You may also attend a series of informal tutorials designed to develop your written and communication skills. 4B06 students are to design and present an oral presentation highlighting their work at the end of the year and 4F09/4R12 students are to prepare 2 oral presentations designed to highlight their work. All students are to submit a write-up of their work at the end of the year in the format of a thesis. Good luck and have fun😊

Biochem 4B06: An extended 6-unit senior research project in Biochemistry and Biomedical Sciences. Assessment is based on laboratory work (approximately 12 hours per week over two terms), an oral presentation and a final thesis report.

Biochem 4F09: A 9-unit senior thesis based on a major research project in Biochemistry and Biomedical Sciences. Assessment is based on laboratory work (an average of approximately 18 hours per week over two terms; depending on the distribution of the course load), two oral presentations and a final thesis report.

Biochem/HthSci 4R12: A 12-unit senior thesis based on a major research project in Biochemistry and Biomedical Sciences. Assessment is based on laboratory work (an average of approximately 24 hours per week over two terms; depending on the distribution of the course load), two oral presentations and a final thesis report.
Evaluation breakdown:

<table>
<thead>
<tr>
<th>Assessment tool</th>
<th>Biochemistry 4B06</th>
<th>Biochemistry 4F09</th>
<th>Biochemistry/HthSci 4R12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-year laboratory work (and overall research ability) evaluation</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Oral Presentation(s) - PowerPoint</td>
<td>25%</td>
<td>1 presentation</td>
<td>25%</td>
</tr>
<tr>
<td>Final-year laboratory work (and overall research ability) evaluation</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Thesis</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
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* N/A – not applicable

“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.”

Schedule of Events and Due Dates:

<table>
<thead>
<tr>
<th>EVENT</th>
<th>DUE DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial meeting form (4B06/4F09/4R12)</td>
<td>Thursday September 20th, 2012 - (submission by student)</td>
</tr>
<tr>
<td>Tutorials</td>
<td>TO BE ANNOUNCED</td>
</tr>
<tr>
<td>4F09/4R12 Oral PowerPoint presentation 1</td>
<td>Wednesday December 5th, 2012</td>
</tr>
<tr>
<td>4F09/4R12 Oral PowerPoint presentation 2</td>
<td>Thursday April 11th, 2013</td>
</tr>
<tr>
<td>4B06 Oral PowerPoint Presentation 1</td>
<td>Thursday April 11th, 2013</td>
</tr>
<tr>
<td>Mid-year lab evaluation form (4B06/4F09/4R12)</td>
<td>Monday November 26th, 2012 - (submission by lab supervisor)</td>
</tr>
<tr>
<td>Final-year lab evaluation form (4B06/4F09/4R12)</td>
<td>Wednesday April 3rd, 2013- (submission by lab supervisor)</td>
</tr>
<tr>
<td>Thesis (4B06/4F09/4R12)</td>
<td>Tuesday April 16th, 2013</td>
</tr>
</tbody>
</table>

UNLESS OTHERWISE SPECIFIED, all assignments and final write-ups (theses) are to be handed in during the designated due date no later than 4:00pm in the Biochemistry drop boxes (black cabinet by HSC-4H39) Late penalty: 10% / day and will NOT be accepted after 5 days. An MSAF or Approval from the Associate Dean’s must be provided for any missed work (includes extensive lab work). Please go to the following website to obtain information on this process ([http://www.mcmaster.ca/msaf/](http://www.mcmaster.ca/msaf/))
This course outline contains the following:

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<th>Page</th>
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<tr>
<td>Description of events</td>
</tr>
<tr>
<td>✓ Initial meeting form</td>
</tr>
<tr>
<td>✓ Tutorials</td>
</tr>
<tr>
<td>✓ Presentation dates</td>
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<tr>
<td>✓ Submission of final thesis</td>
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<tr>
<td>✓ Biochemistry and Biomedical Sciences Undergraduate Research Day</td>
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<tr>
<td>✓ Mid-Year Laboratory Work Evaluation</td>
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<td>✓ Final-Year Laboratory Work Evaluation</td>
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<td>✓ Lab notebook guidelines</td>
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<tr>
<td>✓ Completion of Lab Work</td>
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<td>✓ Safety Training</td>
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<tr>
<td>✓ Relevant Material/Suggested Books</td>
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<td>✓ Academic Dishonesty Policy</td>
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Description of Events:

Initial meeting FORM (Must be completed by September 20th, 2012) – the student must arrange a meeting with his/her supervisor to discuss the research project, course requirements, work schedule and expectations of supervisor. The student and supervisor must agree on all these terms and then fill out the Initial Meeting Form provided which summarizes the main outcomes of the meeting. This should be handed in to the Administrative Assistant in the Undergraduate program Office (HSC 4H45) no later than September 20th, 2012. Laboratory work should begin following this meeting.

Tutorial - please note that the tutorial hours are not included in the number of hours each student must spend in the lab and tutorials are NOT mandatory! Tutorial dates and times will be announced shortly. Tutorials are designed to guide you through the thesis write-up and the presentations.

4B06/4F09/4R12 presentation dates: December 5th (2012, please note this presentation date is for 4F09/4R12 students only) and April 11th (2013, please note this presentation date is for 4B06/4F09/4R12 students) - Presentations are worth 25% of the final mark. First presentation is a closed forum. Students will be divided into sections and will present in front of a panel of committee members (researchers) and their section peers. Please note that students MUST attend ALL presentations in their section. The second presentation is an open forum. Students will be divided into sections and will present in front of a panel of committee members, their section peers and anyone who wishes to attend. Please note that students MUST attend ALL presentations in their section. Please read the “Biochemistry 4B06/4F09 and Biochemistry/Health Sciences 4R12 Oral Presentation Guidelines” for details.

Submission of final thesis: April 16th (2013) - The thesis is worth 25% of the final mark. Submit 1 ELECTRONIC copy on Avenue2Learn (pdf format, 1 document). Late submissions will be penalized with a deduction of 10% per day from the final mark of the thesis.
Biochemistry and Biomedical Sciences Undergraduate Research Day (April 11th, 2013) – the second annual Biochemistry and Biomedical Sciences Research Day will take place on April 11th, 2013. This is an open conference that will showcase the work conducted by all thesis students in the Department of Biochemistry and Biomedical Sciences ... so feel free to invite your friends and co-workers to your oral/poster presentations! Details of the event will be posted on A2L.

Mid-Year laboratory work evaluation (and overall research ability, 20% of final mark): November 26th, 2012 - Near the end of term 1 the supervisor will fill out and electronically submit a final “Mid-Year laboratory work (and overall research ability) evaluation” form to Felicia Vulcu (electronic submission only: vulcuf@mcmaster.ca).

Final-Year laboratory work evaluation (and overall research ability, 30% of final mark): April 3rd, 2013 - At the end of the term the supervisor will fill out and electronically submit a final “Final-Year laboratory work (and overall research ability) evaluation” form to Felicia Vulcu (electronic submission only: vulcuf@mcmaster.ca).

Supervisors will evaluate their students based on criteria such as:

1. Laboratory Work
   - Ability to plan and execute experiments in an efficient and organized way
   - Skill in laboratory techniques
   - Ability to interpret data; not to overlook any conclusions nor to draw unfounded conclusions

2. Responsibility and commitment to project
   - Demonstration of originality and independence of thought

3. Understanding of the research problem and how it fits in with existing knowledge and future studies

Supervisors are requested to provide justification for the grade assigned with specific comments and examples.

Lab supervisor must meet with the student to discuss this evaluations (please provide the student with a copy of each evaluation form as feedback).

Lab notebook guidelines – These guidelines are suggestions to help you setup your notebook. It is STRONGLY RECOMMENDED that you discuss with your lab supervisor the specifics of maintaining a laboratory notebook.

A notebook is an essential tool to help organize your laboratory research. Number each page of the notebook, date and record each experiment, including the experimental procedure, results and analysis with calculations. The content of the notebook should be easily readable and should contain enough information so that another undergraduate student could repeat the experiment with no prior knowledge. Care should be taken to ensure the notebook is very organized and contains an index for ease of navigation. Make sure to include all details of day-to-day experiments including a purpose for the experiment, any mistakes made throughout the experiment and the conclusions. Include all discussions and thoughts on the experimental goals (this includes email communications between your supervisor/collaborator(s)). This notebook is an integral part of your supervisor’s research and must be left with the supervisor at the conclusion of the project.

To assist with your review of the literature, students will find PubMed to be an excellent research tool. PubMed is a service of the National Library of Medicine which searches the MEDLINE database covering the fields of medicine, nursing, dentistry, veterinary medicine, the health care system, and the preclinical sciences. PubMed includes links to many sites providing full text articles online and other related resources.


Completion of Lab Work – It is recommended that students enrolled in 4B06, 4F09 and 4R12 should aim to have their laboratory experiments completed by the end of Reading Week in February (18th – 22nd, 2013), to allow sufficient time for data analysis, preparing your presentation and writing your thesis. Please discuss the date for completion of lab work with your lab supervisor.

Safety training – Please ensure that students have taken the core/update WHMIS, Fire Training, Biosafety, site-specific and all other relevant safety courses prior to starting in the lab. It is the responsibility of the lab supervisor to ensure all thesis students have received their safety training and are conducting their experiments in a safe manner. It is also the responsibility of the supervisor to ensure their thesis students are being supervised during their time in the lab. If you require more information on this subject please ask your lab supervisor or contact Jodi Biro in the Biochemistry Department (HSC 4N59) or the FHS safety office (HSC 1J11).
Please check the Biochemistry 4B06/ 4F09/4R12 folders on A2L for important information and day-to-day updates and all relevant course material.

**Relevant Material/ Suggested book:** Course outline/ From Research to Manuscript: A Guide to Scientific Writing by Michael Jay Kats. The book is currently available as an (e-resource) at Thode Library. Please focus on Chapters 2 (The Scientific Paper) and 3 (Tools and Techniques).

**Academic Dishonesty -** My assumption is that every student attending this course is doing so to genuinely explore the world of Biochemistry and Biomedical Sciences. Any student that would like to ignore my assumption should visit the Academic Integrity Policy at McMaster University for information on academic dishonesty (http://www.mcmaster.ca/academicintegrity/).
Suggested Thesis guidelines (4B06/ 4F09/ 4R12)

Introduction:

The McMaster University Department of Biochemistry and Biomedical Sciences is dedicated to showcasing the monumental achievements of the undergraduate project students currently undergoing research projects in the department.

Below is an overall description of the submission guidelines which could be followed by each student. Aside from the page length and overall formatting, the remainders of these guidelines are strong suggestions to aid in constructing the overall flow of the thesis (the due date/time is NOT a suggestion: it is a requirement). Students should consult their lab supervisors about the specifics of their thesis construction.

All thesis submissions must be handed in electronically (on A2L) by the specified due date (April 16th, 2013) no LATER than 4:00pm. Please make sure that you submit the thesis as 1 pdf document. You can embed the figures throughout the thesis if you wish and if your lab supervisor prefers this type of formatting.

Formatting Guidelines:

- Manuscript should be formatted for 8.5 x 11 inch paper.
- Text should be formatted as Times New Roman font size 12 with double spacing throughout.
- The entire thesis SHOULDN'T EXCEED 20-25 pages (MAXIMUM LENGTH!!), double-spaced with 1-inch margins all around. This includes all sections from Abstract to Discussion (see below) but excludes References to Supplemental Data.
- All pages should be numbered (bottom, centre, (1, 2, etc.))
- The outline of the manuscript should follow this order:
  - Title, Author(s) (your name first, your supervisor’s name last and name of all other contributing members in between) and name of institution date of submission, name of course
- Abstract
- Introduction
- Materials and Methods
- Results (you can combine the results and discussion sections if you wish)
- Discussion
- References
- Abbreviations
- Figure Captions
- Tables
- Figures
- Supplemental data (If applicable)

Title: should be short and straight to the point (no more than 2 printed lines)

Abstract: should be clear and concise in its summary of your main finding(s). This section should not exceed 300 words.

Introduction: should clearly place your findings in the context of the field as a whole. This section should not be used as a long summary of the field. Diagrams explaining your points are highly recommended (they must be original creations NOT copied from other sources!)

Materials and Methods: should be concise and easy to follow so that your experiments could be repeated by another student. The experiments should be clearly laid out and must spell out all buffers used (including concentrations), all equipment used, centrifuge rotors used, speeds of centrifuges, method of lysing cells, etc. PLEASE FOLLOW THE SAME GUIDELINES YOU USED IN YOUR OTHER LAB COURSES (2L06, 3P03). When constructing clones ALL primers used must be written out. REFERENCE!!

Results: This section should describe the data presented in your figures. Care must be taken not to over-analyze or discuss the data in this section.
Discussion: This section is designed entirely for interpreting the data. You can include future experiments that need to be done, other controls that should be performed and even your opinion on what the data might mean to the field as a whole. You can even use a diagram to make your point clear. Care should be taken not to over-analyze your data. You should present your ideas in a clear, thought-out manner.

References: should be cited throughout the text by number, example (1). The references should follow the JBC (Journal of Biological Chemistry) format or a format that is used by your lab (keep formatting consistent).

Abbreviations: All abbreviations used in the text should be written out in long form the first time they are introduced, example polymerase chain reaction (PCR). This section should contain all abbreviations used along with their long form.

Tables: Should contain a title and a short description of the table.

Figures/ Figure Captions: should have titles and figure legends describing the experiment in sufficient detail to allow readers to understand the figure in the absence of additional text. The figure legend should include scale bar information for images and details of data points (e.g. mean ± sem). All figures should be high quality.
For graphic images and other image specifications we have adopted the policy outlined by Journal of Cell Biology.

Copied from JCB instructions to authors (http://www.jcb.org/misc/ifora.shtml):

**Image acquisition and manipulation.** The following information must be provided about the acquisition and processing of images:

1. Make and model of microscope
2. Type, magnification, and numerical aperture of the objective lenses
3. Temperature
4. Imaging medium
5. Fluorochromes
6. Camera make and model
7. Acquisition software
8. Any subsequent software used for image processing, with details about types of operations involved (e.g., type of deconvolution, 3D reconstructions, surface or volume rendering, gamma adjustments, etc.).

No specific feature within an image may be enhanced, obscured, moved, removed, or introduced. The grouping of images from different parts of the same gel, or from different gels, fields, or exposures must be made explicit by the arrangement of the figure (i.e., using dividing lines) and in the text of the figure legend. If dividing lines are not included, they will be added by our production department, and this may result in production delays. Adjustments of brightness, contrast, or color balance are acceptable if they are applied to the whole image and as long as they do not obscure, eliminate, or misrepresent any information present in the original, including backgrounds. Without any background information, it is not possible to see exactly how much of the original gel is actually shown. Non-linear adjustments (e.g., changes to gamma settings) must be disclosed in the figure legend.

All digital images in manuscripts accepted for publication will be scrutinized by our production department for any indication of improper manipulation. Questions raised by the production department will be referred to the Editors, who will request the original data from the authors for comparison to the prepared figures. If the original data cannot be produced, the acceptance of the manuscript may be revoked. Cases of deliberate misrepresentation of data will result in revocation of acceptance, and will be reported to the corresponding author's home institution or funding agency.

**Numerical data.** Error bars on graphic representations of numerical data must be clearly described in the figure legend. The number of independent data points (N) represented in a graph must be indicated in the legend. Numerical axes on graphs should go to zero, except for log axes. Statistical analyses should be done on all available data and not just on data from a "representative experiment".

**Supplemental Data:** should follow the guidelines described above but should be included at the end of the manuscript. If new techniques are involved they must be described in a short supplemental materials and methods section. This should be followed by supplemental figure captions and the supplemental figures.

Additional information on writing style can be found at the following website:

http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtoc.html
NOTE: if you miss your presentation time you will receive an automatic zero on the presentation. Also, you must attend ALL presentations for your section.

FIRST ORAL PRESENTATION – December 5th, 2012 (for 4F09/4R12 students)

The first oral presentation should emphasize the:
- Objective of the project
- Background information necessary to understand its relevance and importance
- Research plans
- Methods adopted
- Research work accomplished thus far and further planned

The main goal of the first presentation is to convey your full understanding of the project objective(s) and how it fits in with the field as a whole. The format can be thought of as a research proposal with some preliminary data. This means that emphasis should be placed on the overall aspects of the research plan, the experimental techniques that will be utilized to test your hypothesis (you should know the theory behind these research techniques and possible advantages/disadvantages of each technique) and how they will be implemented in the context of your research objective(s). You should also include data to-date that you have generated using the techniques described and summarize the results obtained thus far and what they represent in the context of your project goals.

All presentations must be created on PowerPoint. A laptop computer and projector will be available for your presentation. Due to time constraints, students will not be able to use their personal laptop. If you plan to use movies or Flash-animation in your presentation, contact Felicia Vulcu or Ishac Nazi to arrange to test the movies on the presentation-laptop at least two days before your presentation.

Students will be required to download a copy of their presentation to a private folder in the 4F09/4R12 A2L folder before 9 am on the day before their presentation (the day before the presentation date is December 4th). Late penalty: 10%/hour. The presentations will be loaded to the departmental laptop that will be used for all presentations.

Each presentation will last 15 minutes with 5-10 minutes of questions and discussion. Presenters cannot use notes during their presentations. Any work done during summer months or prior to the beginning of the project should be clearly identified and acknowledged. Please make sure that you clearly identify on your slide if the data you are showing was generated by another person in your lab.

Students will be divided up into a presentation session. These sessions will be posted on A2L. The first oral presentation is a closed forum. Only the course coordinators, the 4F09/4R12 lab supervisors and the 4F09/4R12 students presenting will be in attendance. Please note, each student MUST attend ALL other presentations in their session. Each student will be evaluated by a committee consisting of the attending supervisors. The lab supervisor will be on the committee as a non-voting consultant, but will not be involved in assigning a grade for the oral presentations.

Students will be evaluated based on their:
1. Understanding of the background
2. Understanding the problem and its significance
3. Knowledge of experimental approach
4. Experimental progress made
5. Ability to interpret/ analyze results
6. Ability to answer questions
7. Overall presentation (includes flow of presentation/ clarity of slides/ quality of slides/ references/ grammar and technical language)

The members of the committee will be asked to fill out and submit an ‘Evaluation of Oral Presentation’ form to Felicia Vulcu (or the Undergraduate Administrative Assistant, HSC-4H45) at the conclusion of the oral presentations.
SECOND ORAL PRESENTATION – April 11th, 2013 (for 4B06/ 4F09/ 4R12 students)

In the second oral presentation students will present the final results of their experiments. This presentation should be a more typical research presentation summarizing your research project. Your focus should be in presenting the data generated and describing how your results fit in with your research plan and the field as a whole.

Please note, this presentation is part of our second Biochemistry and Biomedical Sciences Undergraduate Research Day. All presentations are open for anyone to attend, space permitting.

This second presentation will be early enough for any comments or questions raised to be considered in the written thesis. Again, students will be required to download a copy of their presentation to a private folder in the 4F09/4R12 A2L folder before 9 am on the day before their presentation (the day before the presentation date is April 10th). Late penalty: 10%/hour. The presentations will be loaded to the departmental laptop that will be used for all presentations. If you plan to use movies or Flash-animation in your presentation, Felicia Vulcu or Ishac Nazi to arrange to test the movies on the presentation-laptop at least two days before your presentation.

Each presentation will last 15 min with 5-10 minutes of questions and discussion. Any work done during summer months or prior to the beginning of the project should be clearly identified and acknowledged.

This is an open attendance so anyone can come to see your presentation given room availability. If you have friends and family attending, please ask them to wait until the break before leaving the presentation room so as not to disturb the presenters. Please note; each student MUST attend ALL other presentations in their session. Each student will be evaluated by a committee consisting of the attending supervisors. The supervisor will be on the committee as a non-voting consultant, but will not be involved in assigning a grade for the oral presentations. The members of the committee will be asked to fill out and submit an ‘Evaluation of Oral Presentation’ form to the course coordinator at the conclusion of the oral presentations. Students will be evaluated based on the same criteria as their first presentation.

Students and supervisors will be notified of the exact time and location of the presentations. Please check the A2L folder weekly for updates.

Students will be evaluated based on their:

1. Understanding the background
2. Understanding the problem and its significance
3. Knowledge of experimental approach
4. Experimental progress made
5. Ability to interpret/ analyze results
6. Ability to answer questions
7. Overall presentation (includes flow of presentation/ clarity of slides/ quality of slides/ references/ grammar and technical language)
FORMS and MARKING SCHEMES

- INITIAL MEETING FORM (4B06/4F09/4R12)
- MID-YEAR LABORATORY WORK (AND OVERALL RESEARCH ABILITY) EVALUATION FORM (4B06/4F09/4R12)
- FINAL-YEAR LABORATORY WORK (AND OVERALL RESEARCH ABILITY) EVALUATION FORM (4B06/4F09/4R12)
- EVALUATION OF THESIS MARKING SCHEME (4B06/4F09/4R12)
- EVALUATION OF 1ST ORAL PRESENTATION MARKING SCHEME (4F09/4R12)
- EVALUATION OF 2ND ORAL PRESENTATION MARKING SCHEME (4B06/4F09/4R12)
INITIAL MEETING FORM

For: Biochemistry 4B06, Biochemistry 4F09 and Biochemistry/Health Sciences 4R12

Please take the time with your student to summarize the outcome of the following discussion topics. Please hand in this sheet to the Administrative Assistant in the Undergraduate Program Office (HSC 4H45). The form is due by Sept 20th, 2012.

Research Project (a quick summary of the main goal(s) of the project):

Course Requirements (clearly write out all the course components that need to be achieved by the student and the supervisor):

Work Schedule (a statement showing that the student understands the main concept of the research project and feels confident that the time allotted is sufficient to achieve the goal):

Expectations of supervisor:

Expectations of student:

Summary of summer work (applicable only if student has previously worked in the same laboratory, please attach an additional 1-page summary of summer research completed):

Student Name ____________________________ Supervisor Name ____________________________

Signature of student ______________________

Signature of supervisor (I hereby take full responsibility for the safety of my thesis student during their time in my Lab)

____________________

Date Completed: __________________________
MID-YEAR LABORATORY WORK (AND OVERALL RESEARCH ABILITY) EVALUATION
(TO BE COMPLETED BY THE SUPERVISOR)

For: Biochemistry 4B06, Biochemistry 4F09 and Biochemistry/Health Sciences 4R12

Please complete electronically and email to Felicia Vulcu (vulcuf@mcmaster.ca) NO LATER than Nov 26th, 2012

Student Name /Thesis Course Code (example 4B06): ________________________________

Supervisor Name: ________________________________

Date Completed: ________________________________

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<th>PLEASE COMMENT IN THE SPACES PROVIDED BELOW</th>
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<tbody>
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<td>1. Understanding the problem.</td>
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<tr>
<td>2. Familiarity with relevant literature</td>
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<tr>
<td>3. Initiative</td>
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<tr>
<td>4. Work habits</td>
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<tr>
<td>5. Ability at research</td>
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<tr>
<td>6. Work completed and its significance</td>
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<tr>
<td>7. Data analysis interpretation</td>
</tr>
<tr>
<td>8. Industriousness</td>
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<tr>
<td>9. Experimental judgment</td>
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Overall ability (numerical score out of 100)

12
# FINAL-YEAR LABORATORY WORK (AND OVERALL RESEARCH ABILITY) EVALUATION

(TO BE COMPLETED BY THE SUPERVISOR)

For: Biochemistry 4B06, Biochemistry 4F09 and Biochemistry/Health Sciences 4R12

Please complete electronically and email to Felicia Vulcu (vulcuf@mcmaster.ca) NO LATER than Apr 3\textsuperscript{rd}, 2013

Student Name/Thesis Course Code (example 4B06): ________________________________

Supervisor Name: ________________________________

Date Completed: ________________________________

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**Overall ability (numerical score out of 100)**
EVALUATION OF THESIS

For: Biochemistry 4B06, Biochemistry 4F09 and Biochemistry/Health Sciences 4R12

Please complete electronically and email to Felicia Vulcu (vulcuf@mcmaster.ca) NO LATER than April 23rd, 2013

The thesis should be evaluated based on the following criteria:

1. Understanding of the problem and relevant background information.
2. Results obtained and their interpretation/analysis.
3. In cases where significant problems were encountered, how they were approached and resolved.
4. Clarity of thesis presentation (flow of ideas, smooth transition between concepts, placement of main gap studied within the field of study, citation style and usage, etc).

The journal article is worth 25 marks. Based on the above criteria, please assign a mark out of 25 giving appropriate justification.

Student Name/Thesis Course Code (example 4B06):___________________________________________________________

Supervisor Name: _____________________________________________________________

Date Completed: ____________________________

Final Mark (/25):___________________________

Comments:
EVALUATION OF 1\textsuperscript{ST} ORAL PRESENTATION (Dec 5\textsuperscript{th}, 2012)

For: Biochemistry 4F09 and Biochemistry/Health Sciences 4R12

NOTE: Please note on the sheet if a student is late or not present. If you need any help please contact Felicia at x22838. All students MUST ATTEND ALL presentations in their section!

Date _____________________________________________________
Student Name: __________________________________________________________
Committee Member: ____________________________________________________

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>Maximum Mark</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understanding the background</td>
<td>10*</td>
<td></td>
</tr>
<tr>
<td>2. Understanding the problem and its significance</td>
<td>10*</td>
<td></td>
</tr>
<tr>
<td>3. Knowledge of experimental approach</td>
<td>10*</td>
<td></td>
</tr>
<tr>
<td>4. Experimental progress made (if progress made is inadequate, then the main reasons for it)</td>
<td>5**</td>
<td></td>
</tr>
<tr>
<td>5. Ability to interpret/ analyze results</td>
<td>5**</td>
<td></td>
</tr>
<tr>
<td>6. Ability to answer questions</td>
<td>5**</td>
<td></td>
</tr>
<tr>
<td>7. Overall presentation (includes flow of presentation/ clarity of slides/ quality of slides/ references/ grammar and technical language)</td>
<td>5**</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

*1-2 = unsatisfactory, 3-4 = marginal, 5-6=satisfactory, 7-8 = good, 9-10 = excellent
**1 = unsatisfactory, 2 = marginal, 3=satisfactory, 4 = good, 5 = excellent. A mark of 0 can be given if student does not meet the criteria specified.
EVALUATION OF 2nd ORAL PRESENTATION (Apr 11th, 2013)

For: Biochemistry 4B06, Biochemistry 4F09 and Biochemistry/Health Sciences 4R12

NOTE: Please note on the sheet if a student is late or not present. If you need any help please contact Felicia at x22838. All students MUST ATTEND ALL presentations in their section!

Date _____________________________________________________

Student Name: ________________________________________________

Committee Member: ____________________________________________

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>Maximum Mark</th>
<th>Mark</th>
<th>COMMENTS!!!! (We would really appreciate constructive criticism on these points. We type up the comments and email them to the students so they can improve from this experience. Thank you)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Understanding the background</td>
<td>5**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Understanding the problem and its significance</td>
<td>5**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Knowledge of experimental approach</td>
<td>10*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Experimental progress made (if progress made is inadequate, then the main reasons for it)</td>
<td>10*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Ability to interpret/ analyze results</td>
<td>10*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Ability to answer questions</td>
<td>5**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Overall presentation (includes flow of presentation/ clarity of slides/ quality of slides/ references/ grammar and technical language)</td>
<td>5**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
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