THE COLLEGE OF
WOOSTER

Biochemistry and Molecular Biology

HANDBOOK FOR SENIOR INDEPENDENT STUDY

2012-2013

General Emergency Contact Information

Emergency	From a Safe Location Call	Phone Number
Fire	Emergency	911
	Security	2590 or 8888
Spills	Security	2590 or 8888
		Spill kits are available in stockroom, for minor spills
Personal Injury	Student Wellness Center	2319
	Security	2590 or 8888
Natural Gas	Security	2590 or 8888
Radiation	Radiation safety Officer	Biology 2437 or 1-330-464-0915
Power Outage	Security	2590 or 8888
Environmental Concerns	Environmental Safety Officer	2282 or 1-330-317-6005

Emergency telephone numbers are posted on each floor and in each laboratory.
Please become familiar with these numbers.

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Required Events for 451/452

Safety-Training Seminars:	Held at the beginning of the academic year. Attendance is mandatory.
BCMB Seminars:	Senior BCMB students are required to attend designated BCMB seminars. Students will receive an electronic mail message regarding which seminars are BCMB.
Senior Seminar:	Spring semester of senior year BCMB majors are required to present their project results in a 10-12 minute seminar. Your seminar abstract is required TWO days before your presentation. Abstracts should be turned into Diane Rossey in the Chemistry Department.
Senior Poster Presentation:	Senior BCMB students are required to present a poster outlining I.S. results at a poster session held in April.
Final I.S. Project:	Two bound copies of the I.S. thesis are due in the Registrar's Office by 5:00 PM on the first day of classes following Spring Recess (I.S. Monday). In addition, an electronic copy should be turned in for archival purposes.
Oral Exams:	Following I.S. Monday, schedule an oral examination with your I.S. advisor and second reader. After oral exams, all BCMB students must turn in a final corrected paper copy as well as an electronic copy (CD) to Mrs. Diane Rossey in the Chemistry Department.

CHAPTER 1

Overview of Independent Study in Biochemistry and Molecular Biology

During the three-semester Independent Study program in Biochemistry and Molecular Biology, students…

- identify research projects of interest,
- write a research proposal describing the significance, objectives and experimental design of their assigned project,
- conduct investigations to collect data addressing their objectives, and
- present their work orally and in writing.

This chapter provides additional information on the I.S. process in the Biochemistry and Molecular Biology major.

Courses

BCMB 40100. Introduction to Independent Study

This course focuses on scientific writing, experimental design, and informational retrieval systems, including accessing and evaluating the growing collection of molecular databases. Students explore the literature related to their proposed senior I.S. thesis through a series of structured writing assignments that culminate in a research proposal for the senior project. In addition, students learn the mechanics of scientific presentations and give a brief seminar on their proposed project. Annually. Spring.
-- The College of Wooster Catalogue

Assignment of I.S. Research Projects

The assignment of an Independent Study research project is a two-step process: First, you will identify three research projects that are of interest to you; then assignments will be made by the BCMB curriculum committee after examining everyone's preferences.

Possible Research Projects: During the first weeks of BCMB 401, students learn about research opportunities available at Wooster. Most research projects pursued by BCMB majors are closely tied with a professor's research interests or with an outside investigator near Wooster (*e.g.*, at the OARDC). If you desire to develop your own project, you must identify a research scientist willing to sponsor your research by providing intellectual and material support.

Assignments: Once all BCMB 401 students have submitted their list of preferred research projects, the BCMB curriculum committee makes I.S. project assignments. The intent is that each student will be assigned a project of interest, while evenly distributing I.S. assignments among participating faculty members.

Preparation of a Research Proposal

The major focus of BCMB 401 is the development of a research proposal. Full details concerning the preparation of this proposal and its evaluation are described in the BCMB 401 syllabus.

BCMB 45100. SENIOR INDEPENDENT STUDY – SEMESTER ONE

An original investigation is conducted, culminating in a thesis and oral defense of the thesis in the second semester. During the year each student gives at least one research poster and oral presentation on the research topic. A student normally has one research advisor. Prerequisite: C- or better in BCMB 40100. -- The College of Wooster Catalogue

BCMB 45200. SENIOR INDEPENDENT STUDY – SEMESTER TWO

The thesis is evaluated by the research advisor and one other professor from the BCMB Curriculum Committee, in consultation with the other members of the BCMB Curriculum Committee. Prerequisite: BCMB 45100.-- The College of Wooster Catalogue

Senior Year: Completing Your IS Research

Getting Started

As each project has its own requirements, it is not possible to draw up a schedule of events that will apply uniformly. Ideally, data collection will be completed during the first semester and the thesis written in the second. In practice, the best-laid plans don't always work out. It is almost a certainty that the collection of data or the writing of the thesis, or both, will take longer than you anticipate. The message is simple: Get started immediately. It is far better to finish a little early than to reach for the panic button as the due date approaches!

Safety Training Sessions

Each student is required to attend safety-training sessions offered by the department of the I.S. advisor. These are typically held at the beginning of the academic year, so look for their announcement. Attendance is mandatory: Students will not be allowed to conduct laboratory research until the training sessions have been completed.

Work Expectations

Students are expected to work regularly and consistently on Independent Study. Of course, some weeks will be more productive than others, but overall BCMB 451/452 students are expected to average about 12 hours per week, working in the laboratory, analyzing data, searching for relevant articles, writing the thesis, etc.

Students should work safely in the laboratory and conduct themselves consistent with safe lab procedures, as introduced in the departmental safety training sessions and supplemented by your advisor. You should also follow appropriate lab etiquette, by respecting the rights, property and safety of others. This includes keeping common areas clean and quiet, sharing common equipment, including computers, with others, and ensuring that materials are returned to their original location or reordered.

Meetings with I.S. Advisor

I.S. students should meet with their on-campus advisor regularly, typically on a weekly basis. During these meetings, you should come prepared to discuss your research progress and to address any research

questions that you have. You should use this opportunity to explore ideas, troubleshoot problems in the laboratory, review a draft of your thesis, or discuss other aspects of your Independent Study research. You are encouraged to bring your laboratory notebook (see below) to each meeting.

Keeping a Laboratory Notebook

A complete record of your laboratory work is required. Your laboratory notebook must contain originals of all of the methods and results of the I.S. research and must be kept current throughout the two semesters of research.

The complete record of the laboratory work should be brought to the I.S. oral examination, where it will be turned over to your supervisor. (You may wish to make a photocopy of your own beforehand.) Because it may be used as reference material during the oral examination and because it is important for future reference by subsequent researchers, the laboratory notebook must be completely and unambiguously labeled, indexed and cross-referenced.

Seminar Attendance

Communication of research findings is an integral part of the scientific process. BCMB 401/451/452 students are required to attend designated BCMB seminars. Attendance will be taken, and unexcused absences may negatively affect your grade. The BCMB seminar schedule will be posted on the BCMB web site.

Seminar Presentation

During the spring semester, senior BCMB majors will be required to present a final 10-12 minute seminar summarizing the results of their project. These presentations will be at the 11:00 AM Tuesday/Thursday seminar hour. The BCMB seminar schedule will be posted on the BCMB web site.

At least two days before your presentation, you must submit an abstract to Diane Rossey in the Chemistry Department office for distribution. Consult your advisor for help and details in preparing your talk and abstract (also see Chapter 2).

Poster Presentation

Senior BCMB majors are required to present a poster describing their I.S. project at a poster session that will be held in April. Again, consult your advisor for help and details in preparing your talk and abstract (also see Chapter 2).

Details about the poster session will be communicated at a later date.

Thesis Preparation

As you write your thesis, you should expect to submit one or more drafts to your advisor for review. Consult with your advisor regarding deadlines and the review process. (For example, some advisors may review individual sections, while others may prefer the entire thesis.)

See Chapter 2 for detailed information on mechanics of the written thesis.

The Second Reader

Each thesis is read by your faculty advisor (the first reader) and a second reader from the Biochemistry and Molecular Biology curriculum committee or as approved by the committee in special circumstances. The second reader will be assigned to you by the BCMB committee and announced shortly after I.S. Monday. For double majors the second reader will typically be the advisor in the second department.

Independent Study Oral Examination

Your I.S. oral examination will take place following the submission deadline for I.S. theses. After you have been notified of your second reader, you should promptly arrange a specific time and place that is acceptable to you, your advisor, and the second reader. If you have done your work off campus (*e.g.*, at the OARDC), your off-campus advisor should be invited to participate. While this person may ask you questions and participate in the discussion during your oral examination, your grade on the thesis is determined solely by the first and second readers, in consultation with the BCMB curriculum committee (see below). The oral examination is focused around your I.S. thesis and may also delve into topics within the BCMB curriculum as a whole. Immediately following the examination you will learn whether you have passed or failed; however, your final grade will be determined in consultation with the BCMB committee at a later date in the semester.

Corrections to the Thesis

It is likely that the oral examination will uncover minor problems that will require some final modification of the written thesis. These might be simple typographical errors or something more substantial. In any case, you are likely to leave the oral examination with a list of changes to be made and with the admonition that you will not receive a grade until the corrected thesis has been re-submitted (and you have complied with all expectations; see below).

Final Checkout

You should prepare a copy of the corrected thesis and turn it in directly to your I.S. advisor. The advisor may request that you permanently bind this copy for their archives. If you worked off-campus, be sure to provide your off-campus advisor with a copy of the final thesis. In addition, you must submit a complete paper and electronic version (with all figures and tables) to Mrs. Rossey in the Chemistry Department.

Details on submitting an archival electronic copy of your I.S. can be found on the Registrar's web site.

The department administrator or laboratory manager of the building in which you worked will then certify that your workspace in either Mateer or Severance is clean and that all your research materials have been returned. The required checkout form can be found at the end of this handbook.

Finally, the Biochemistry and Molecular Biology committee will seek your assistance in assessing the program for continued improvement. To this end, all BCMB students are expected to complete a senior exit survey and an assessment exam during the final weeks of the semester.

Determination of Grades

Your grade for BCMB 451 is determined by your I.S. advisor, using the College's two-level system. A grade of SP (Satisfactory Progress) indicates satisfactory progress has been made during the first semester of Independent Study; a grade of NC (No Credit) indicates unsatisfactory performance.

As noted above, your grade for BCMB 452 is assigned by your advisor in consultation with the second reader and the Biochemistry and Molecular Biology curriculum committee. Grades are assigned based on the quality of your research, thesis, presentations, oral examination and your ability to navigate these requirements in a timely and professional manner (see Chapter 2).

Final grades are available only after all oral examinations are completed in the BCMB program and the curriculum committee has met to discuss I.S. grades. To receive your grade, you must first complete the final checkout process (see above).

CHAPTER 2

Guidelines

I. Thesis

A. Organization of the Written Document

i. Preliminary Pages

a. Title Page—A title page should be included like the one attached below.
b. Table of Contents
c. Abstract

ii. Introduction—This section should outline relevant background information in the field of research, first broadly and then in a focused way, to set up the scientific problem being investigated. The student should carefully review relevant literature and cite references where appropriate.

iii. Experimental Procedures—This section should outline the materials that were obtained or generated for the project and include any and all information on experimental procedures necessary such that the work can be reproduced by another individual.

iv. Results. This section should include findings from successful experiments that relate to the scientific problem. It may include any or all of the following, with text that provides explanation of the results.

a. Tables of data. See *The ACS Style Guide* or Pechenik's *A Short Guide to Writing about Biology* for suggestions on constructing tables.
b. Equations derived from the data. (Example: If kinetic data are presented, the rate equations should be included.)
c. Experimental schemes concerning chemicals, apparati, techniques and methods of calculation, to the extent that they have a direct bearing on the results.
d. Figures, such as diagrams and data images (e.g., gel, spectra, graphs, etc.).
e. Additional guidelines:
    1. All figures and tables should be titled and numbered.
    2. Figures should be presented within proper margins. Reduce as necessary.
    3. Graph axes and spectra must be labeled and legible, including units and the scale for each axis.
    4. Indicate data points by circles, triangles, squares or crosses.
    5. Describe the figure in a separate caption.
    6. Include and explain any statistical analysis where relevant. See Pechenik's *A Short Guide to Writing about Biology* for proper presentation.

v. Discussion. This should be a detailed, thoughtful analysis of all results presented as they fit into a larger context. Developing a hypothetical model or a reaction scheme that accounts for the results included is a useful way for developing this section.

vi. Literature Cited. Include a complete citation for any references that were cited in the individual sections of the document. Students may wish to use EndNote or another reference manager to facilitate formatting and maintenance of all references cited.

vii. Appendices. (Additional tables or figures may be appended to give details that are extra information, not suitably placed in the body of the thesis. The pages are numbered consecutively with the preceding pages.)

Sample Title Page

The College of Wooster

Kinetic Analysis of Polymorphic Creatine Kinase Variants Isolated from Fighting Scots

A THESIS SUBMITTED TO THE FACULTY OF THE COLLEGE OF WOOSTER
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF BACHELOR OF ARTS

By

Esmeralda N. von Bingen

Accepted by Mark J. Snider _____ Advisor

(To be added on final copy) _____ Second Reader

Wooster, Ohio
I.S. Monday (specify date)

B. Formatting Guidelines.

i. The thesis should be printed on 8 ½ x 11" printer paper. It can be printed back-to-back.

ii. Margins: All 1"

iii. Headings and Subheadings: Headings and subheadings for sections should be centered. Major headings should be indicated in ALL CAPS. All major sections should start on a new page.

iv. Spacing: Double spacing should be used throughout the document. Each subsection should be delineated with a quadruple space.

v. Page Numbers: All pages, including those containing only figures, should be numbered at the top of the page (at ¾" below the edge). The number should be omitted on page 1.

vi. Binding: The two copies of the thesis submitted to the Registrar must be bound. Mrs. Rossey in the Chemistry Department office can assist with this, but please allow enough time to do so (at least three hours)

II. Research Seminar

Each BCMB I.S. student will present a seminar during the spring semester. Talks should last no longer than 12 minutes. Following the talk, several minutes will be allotted for questions. Students should rehearse their talks with their advisor for guidance and to ensure that they can complete their presentation within the time limits.

A. Guidelines for Organizing Talks.

i. Provide a brief overview of pertinent literature to introduce the topic. Start broadly, and then refine the focus to highlight the significance of your research objective.

ii. The body of the presentation should contain the experimental setup and data obtained in the laboratory. Interpret your findings in the context of your original objectives and the larger field.

iii. Summarize the goals, methods, results, and future directions to finish your presentation.

iv. Students are encouraged to use visual aids and make presentations in Powerpoint. Handouts may also be provided to the audience.

III. Poster

All students enrolled in BCMB 452 will make a poster to present at the I.S. poster session in the spring in Severance Hall. Attendance at the entire poster session is mandatory.

A. Poster Format and Guidelines.

i. Poster size: 3' x 4' (the paper for the large format printer is 3' wide)

ii. The student should consult his/her advisor to discuss format and content and can find specific rules for poster layout in *The ACS Style Guide* (on reserve in Timkin Science Library).

iii. Software that can be utilized include PowerPoint or Canvas. Computers in Severance 111 and Mateer 305 have licensed copies of these programs.

iv. Consult the Technology@Wooster web site for current instructions on poster printing.

B. Abstract Submission.

The Senior I.S. Poster Session Booklet will be prepared by Mrs. Rossey in the Chemistry Department (email: drossey@wooster.edu). Students must submit their abstract the week before the poster session.

i. Abstracts should include Title, Authors (Senior I.S. student, advisor, and any other contributors) and text. It can include reactions, structures, or equations, within reason. The abstract should not include references.

ii. Length: 200 words or less

iii. Format: Microsoft Word

iv. Email as an attachment

v. In the email, include your plans after graduation.

Assessment Forms for Senior Independent Study

Biochemistry and Molecular Biology 11/2006
Senior Independent Study

1. Seminar Assessment Form

Name of Student: _____ Evaluator's Initials: _____

Title of Presentation: _____

Date: _____

Specific Rating Scale:	**5**— Excellent	**4**—Very good (no problems noted)	**3**—Meets professional standards	**2**—Some problems that affected quality of presentation	**1**—needs substantial improvement	**NA**—not applicable
PROJECT DESCRIPTION						
Abstract	5	4	3	2	1	NA
Relevance and completeness of scientific background	5	4	3	2	1	NA
Clarity of goals / specific aims	5	4	3	2	1	NA
Description of motivation for research	5	4	3	2	1	NA
Presentation of data (graphical, visual, etc.)	5	4	3	2	1	NA
Explanations of significant results	5	4	3	2	1	NA
Scientific reasoning/technical explanations	5	4	3	2	1	NA
Justification for summaries/conclusions	5	4	3	2	1	NA
PRESENTATION MECHANICS						
Transitions and organization	5	4	3	2	1	NA
Pace and timing	5	4	3	2	1	NA
Quality of visuals	5	4	3	2	1	NA
Use of appropriate chemical terminology	5	4	3	2	1	NA
Speech	5	4	3	2	1	NA
Effectiveness of nonverbal communication	5	4	3	2	1	NA
Professionalism in demeanor and appearance	5	4	3	2	1	NA
GENERAL CHARACTERISTICS						
Evidence of preparation	5	4	3	2	1	NA
Overall understanding of project	5	4	3	2	1	NA
Thoughtful responses to questions	5	4	3	2	1	NA
Recognition of target audience	5	4	3	2	1	NA
OVERALL EVALUATION	5	4	3	2	1	

Specific comments:

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Senior Independent Study

2. Process Assessment Form

Name of Student: _____ Advisor: _____

Title of I.S.: _____

Date Completed: _____ Completed by: Senior Independent Study Advisor

PART I. PROGRESS IN RESEARCH

Specific Rating Scale:	**5**—mastery	**4**—no discernible problems	**3**—some minor problems	**2**—some problems that affected quality of work	**1**—needs substantial improvement	**NA**—not applicable
EXPERIMENTAL DESIGN AND PREPARATION						
Appropriate experiments for chemical problem	5	4	3	2	1	NA
Level of detail in experimental design	5	4	3	2	1	NA
Understanding of limitations (cost, equipment, time, etc.)	5	4	3	2	1	NA
Creativity in experimental design	5	4	3	2	1	NA
Appreciation for safety precautions	5	4	3	2	1	NA
Improvement in ability	5	4	3	2	1	NA
EXPERIMENTAL IMPLEMENTATION						
Accuracy and completeness of records	5	4	3	2	1	NA
Proficiency in techniques	5	4	3	2	1	NA
Ability to troubleshoot experimental difficulties	5	4	3	2	1	NA
Consideration for others using lab space and facilities	5	4	3	2	1	NA
Respect for instrumentation and research materials	5	4	3	2	1	NA
Use of appropriate safety measures	5	4	3	2	1	NA
POST EXPERIMENT						
Analyze data in appropriate means	5	4	3	2	1	NA
Organized data in a logical manner	5	4	3	2	1	NA
Extrapolate from results logical next-step in research	5	4	3	2	1	NA
Conduct ethical research in accordance to Chemist's Code of Conduct	5	4	3	2	1	
OVERALL EVALUATION	5	4	3	2	1	

PART II. INDIVIDUAL DEVELOPMENT

Specific Rating Scale:	**5**—mastery	**4**—no discernible problems	**3**—some minor problems	**2**—some problems that affected quality of	**1**—needs substantial	**NA**—not applicable
MEETINGS WITH ADVISOR						
Came prepared with questions, results, ideas, etc.	5	4	3	2	1	NA
Engaged in discussion of project	5	4	3	2	1	NA
Followed through with discussions and goals set during meetings	5	4	3	2	1	NA
SCIENTIFIC WRITING						
Prepared sections of thesis in a timely manner	5	4	3	2	1	NA
Addressed issues or problems noted by advisor during writing process	5	4	3	2	1	NA
Writing is representative of student's efforts and represents individual's style (within the context of a scientific thesis)	5	4	3	2	1	NA
Writing is in accordance with the code of academic integrity and ethical guidelines for scientific research (correct citations, avoiding plagiarism, accurate representation of data)	5	4	3	2	1	NA
Improvement in ability to write in a scientific manner	5	4	3	2	1	NA
DEVELOPMENT IN FIELD OF STUDY						
Understanding of important methods used for specific field of chemical research	5	4	3	2	1	NA
Independence in seeking out and integration of contributions in primary literature related to the individual's project	5	4	3	2	1	NA
Application of reported methods and extending new methods to IS research project	5	4	3	2	1	NA
Recognition of the place of the project in the context of a larger problem in chemistry	5	4	3	2	1	NA
GENERAL CHARACTERISTICS						
Effective communication of scientific research	5	4	3	2	1	NA
Integration of the results into the larger scientific context	5	4	3	2	1	NA
Maturation in scientific reasoning	5	4	3	2	1	NA
Enthusiasm and self-motivation in research	5	4	3	2	1	NA
Took ownership of the research project during the course of IS	5	4	3	2	1	NA
OVERALL EVALUATION	5	4	3	2	1	

Additional comments regarding the student's progress during the course of Independent Study:

Biochemistry and Molecular Biology 11/2006
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3. Thesis Assessment Form

Name of Student: _____ Evaluator's Initials: _____

Title of I.S.: _____

Date: _____ ☐ First Reader ☐ Second Reader

Specific Rating Scale:	**5**—mastery	**4**—no discernible problems	**3**—some minor problems	**2**—some problems that affected quality of work	**1**—needs substantial improvement	**NA**—not applicable
ABSTRACT						
Brief statement of research problem or purpose	5	4	3	2	1	NA
Brief summary of actual experimental plan	5	4	3	2	1	NA
Brief summary of significant findings, data, and conclusions	5	4	3	2	1	NA
Comments:						
INTRODUCTION						
Organization	5	4	3	2	1	NA
Description of motivation for research	5	4	3	2	1	NA
Clarity of hypotheses/goals/specific aims	5	4	3	2	1	NA
Relevance and adequacy of background information	5	4	3	2	1	NA
Synthesis of background information to illustrate contextual understanding of material	5	4	3	2	1	NA
Comments:						
METHODS						
Organization	5	4	3	2	1	NA
Level of detail	5	4	3	2	1	NA
Description of data analysis	5	4	3	2	1	NA
Comments:						

DISCUSSION						
Organization	5	4	3	2	1	NA
Explanation of results in context of literature	5	4	3	2	1	NA
Integration of results with goals / hypotheses / specific aims	5	4	3	2	1	NA
Critical analysis of errors / evaluation of results	5	4	3	2	1	NA
Summary of major conclusions	5	4	3	2	1	NA
Suggestions for future work	5	4	3	2	1	NA
Comments:						
STYLE						
Mechanics and grammar	5	4	3	2	1	NA
Formatting	5	4	3	2	1	NA
Use of citations (e.g. Was everything cited appropriately? Did student rely on multiple references, rather than only a few?)	5	4	3	2	1	NA
Clarity	5	4	3	2	1	NA
Professionalism/maturity of writing	5	4	3	2	1	NA
Understanding of target audience	5	4	3	2	1	NA
Comments:						
OVERALL EVALUATION	5	4	3	2	1	

General comments:

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4. Poster Assessment Form

Name of Student: _____ Evaluator's Initials: _____

Title of Poster: _____

Date: _____ ☐ First Reader ☐ Second Reader

Specific Rating Scale:	**5**—mastery	**4**—no discernible problems	**3**—some minor problems	**2**—some problems that affected quality of work	**1**—needs substantial improvement	**NA**—not applicable
POSTER MECHANICS						
Text	5	4	3	2	1	NA
Graphics	5	4	3	2	1	NA
POSTER CONTENT						
Statement of research goals	5	4	3	2	1	NA
Level of detail	5	4	3	2	1	NA
Presentation of results	5	4	3	2	1	NA
Summary / conclusions	5	4	3	2	1	NA
References	5	4	3	2	1	NA
OVERALL EVALUATION	5	4	3	2	1	

Comments:

Biochemistry and Molecular Biology 11/2006
Senior Independent Study

5. Oral Examination Assessment Form

Name of Student: _____

Title of I.S.: _____

Date of Oral Examination: _____ Evaluator's Initials: _____

☐ First Reader ☐ Second Reader

Specific Rating Scale:	**5**—mastery	**4**—no discernible problems	**3**—some minor problems	**2**—some problems that affected quality of work	**1**—needs substantial improvement	**NA**—not applicable
Breadth of knowledge (fundamental concepts in field)	5	4	3	2	1	NA
Depth of knowledge (concepts related to specific project)	5	4	3	2	1	NA
Recognition of place of project in context of the general problem in chemistry	5	4	3	2	1	NA
Understanding of significance of results	5	4	3	2	1	NA
Ownership of research	5	4	3	2	1	NA
Demonstration of critical thinking	5	4	3	2	1	NA
Independence in thought	5	4	3	2	1	NA
Comfort with material	5	4	3	2	1	NA
Effective communication of scientific research	5	4	3	2	1	NA
OVERALL EVALUATION	5	4	3	2	1	

Specific comments:

Cumulative evaluation for Second Reader only:

Suitability of experimental design	5	4	3	2	1	NA
Appropriateness of data analysis	5	4	3	2	1	NA
Overall quality of project	5	4	3	2	1	NA

Student Obligations for BCMB I.S. Check-Out

Name: _____

Please complete the following obligations and return this form to Mrs. Rossey, by the specified date, in order for your I.S. grade to be given to the Registrar.

Obligation	**Signature**
Check-out of your I.S. lab space by cleaning that space, returning materials to the stockroom and discussing with your advisor the location of remaining samples.	_____ (Stockroom personnel) _____ (advisor)
Submit final thesis and poster to advisor	_____ (advisor)
Submit thesis to Chemistry Office in Severance for archive	_____ (Mrs. Rossey)
Submit corrected thesis to Registrar for library archive	_____ (Registrar personnel)
Return desk and room keys	_____ (Office personnel)
Complete assessment materials *Group time:* **TBA** *Individual time:* per appointment with chairperson	_____ (BCMB Chairperson)