

Academic Program Assessment Plan Checklist

Colorado State University-Pueblo

May 20, 2011

All academic departments are responsible for developing meaningful assessment plans for their master and baccalaureate programs. This checklist, while not exhaustive, is a basic outline for creating or re-creating plans. It complements the CSU-Pueblo *Academic Program Assessment* handbook and together, they will help you define appropriate student learning outcomes, collect evidence of students learning, evaluate that evidence relative to the outcomes, and make appropriate program adjustments where appropriate.

Please consider the following as you develop your student learning outcomes assessment plans:

Identification

- What is the name of the academic program and school?

College or Science and Mathematics, Department of Biology, MS in Biology

- By whom and on what date was the plan developed?

Jeff Smith, Ph.D., Associate Prof. Biology, Director MS Program in Biology, with consultation of the faculty of biology, AY 2010-11

- Who is the primary contact for assessment?

Jeff Smith, Ph.D., Associate Prof. Biology, Director MS Program in Biology

Mission, goals and student learning outcomes

- What is the mission of the department and how does it relate to the school's mission?

Department Goals

To prepare students to become productive, accountable and responsible employees upon entering the work force; To prepare students to enter and succeed in graduate or professional schools; To develop in students a broad-based theoretical foundation supplemented by laboratory and field experience that allow individual observations, interpretations and applications; and To allow those students seeking a minor in biology to supplement and strengthen the major field of study.

University Mission

There is hereby established a University at Pueblo, to be known as Colorado State University-Pueblo, which shall be a regional, comprehensive university with moderately selective admissions standards. The University shall offer a broad array of baccalaureate programs with a strong professional focus and a firm grounding in the liberal arts and sciences. The University shall also offer selected masters level graduate programs. (Colorado Statutes 23-55-101)

Colorado State University-Pueblo is committed to excellence, setting the standard for regional comprehensive universities in teaching, research and service by providing leadership and access for its region while maintaining its commitment to diversity.

Alignment Between Department and University Mission

The department of biology goals supports the university mission by training future professionals in the biological sciences, by offering a MS program in Biology, and by setting the standard for regional universities in teaching, research and diversity.

- What is the mission of the program and how does it relate to the department's mission?

Graduate Programs in Natural Sciences

The College of Science and Mathematics offers Master of Science degrees in three disciplines within the Natural Sciences: Biology MS, Chemistry MS, and Biochemistry MS. Students completing any of these degrees will develop advanced skills in the general discipline of choice and will apply these skills in the completion of a thesis research project or internship.

The graduate program leading to the degree of Master of Science in Biology prepares students to apply basic scientific principles to the practical biological problems encountered in business, industry, government, and education. Graduates from the program will be able to apply the techniques of scientific research to real-world biological problems. Course work may include several important areas relevant to biology, including biotechnology, bio-fuels, statistics, environmental, molecular, and cellular biology. A unique feature of the program is its 3+2 plan which is described elsewhere in this catalog.

The 3+2 plan allows a student to simultaneously receive a BS and an MS degree in five years. The Master of Science in Biology requires 30 or 32 semester credit hours of approved graduate course work for, respectively, the thesis (30) or the non-thesis option (32).

Alignment Between Program and Department Mission

The MS in Biology Program supports the department goals by preparing students for success in industry, government and education, and by training its graduates through field and laboratory experiences to solve real world problems in the biological sciences.

- What are the student learning outcomes and how do they relate to the program's mission?

Expected Student Learning Outcomes

Upon completion of the Biology MS or BS/MS students will have developed skills, and will demonstrate competence in the following learning outcomes: Effective application and critical evaluation of scientific method including hypothesis testing, experimental design, and data analysis. Effective communication skills for dissemination of biological scientific understanding to other scientists, and to the public. Development of a knowledge base with content at a professional level of depth for the selected sub field of biology selected for study.

Alignment Between the MS in Biology Program Learning Outcomes and the Program Mission

The MS in Biology Program Learning Outcomes support the program mission by training graduates to have developed advanced problem solving skills in the biological sciences including application of scientific method, effective communication of scientific ideas, and development of a knowledge base relevant to the particular sub-discipline of study.

- Are learning outcomes written as observable skills and abilities?

Effective application and critical evaluation of scientific method including hypothesis testing, experimental design, and data analysis. This is observable through the process of research project design and implementation leading to the thesis defense. Demonstrations include; hypothesis generation and testing in the laboratory, field, or internship, and analysis and interpretation of data with respect to supporting the hypothesis and literature base from which it is derived. These will be evaluated in the committee meetings, the thesis defense, and in the written thesis.

Effective communication skills for dissemination of biological scientific understanding to other scientists, and to the public. This is observable in the public seminar as part of the core course requirement in BIOL 593, in committee meetings, and in the public seminar at the thesis or internship defense, and in the defense of the written thesis.

Development of a knowledge base with content at a professional level of depth for the selected sub field of biology selected for study. This is demonstrated in the core coursework, at required committee meetings, and in the defense of the internship or thesis.

- Are the outcomes discrete (i.e., non-overlapping)?

The catalog outcomes (scientific method, communication and knowledge base) are discreet but mutually supportive of one another. For example, design of a useful scientific method-based approach to solving a problem does not require good communication skills or a significantly deep knowledge base, however, the latter two items are each supportive of a more meaningful approach to the first. The same is true of the relationship between communication skills and a knowledge base or application of scientific method, and between a knowledge base and scientific method skills or communication skills.

- Are the outcomes limited in number to five or six but not more than eight?

There are three major foci in the current catalog outcomes (scientific method, communication and knowledge base). The department of biology has further differentiated these into five outcomes as follows:

Mastery of the Scientific Method

Independent development and mastery of problem solving skills including experimental design, execution, critical analysis, and interpretation of the results of original scientific experimentation (thesis) or experiential learning (internship).

Dissemination of Scientific Products

Persuasive communication and defense of significant results of original scientific investigation presented in both written and oral format at a graduate peer-professional level.

Utilization of the Literature

Critical evaluation of an independently accessed comprehensive body of scientific literature which is project relevant and foundational in supporting and explaining research findings in both written and oral format.

Development of a Relevant Knowledge Base

Development of intrinsically held fundamental field-specific knowledge which will be applied to explain and defend research findings at a level of mastery expected by peer-professionals.

Professionalism and Self Responsibility

Maintain a consistent professional work ethic of independently taking the initiative and motivation to produce tangible products of a quality commensurate with peer-standards in graduate or professional schools or in the career field being pursued.

- What are the performance criteria? What level would you expect students to perform the outcomes at? What percentage of students should be at that level?

Performance criteria will be the faculty and public evaluation forms for the public seminars associated with BIOL 593 and the thesis defense, committee meeting, defense, and written thesis evaluation rubrics completed by faculty members of the students committee. Students performing below an individually prescribed level on these assessments will be instructed in specific improvements that are to be made en-route to the thesis defense. Students failing to make satisfactory progress at committee meetings will not be allowed to progress to the defense until the prescribed improvements are made, or may be dismissed from the program as described in the MS Handbook as follows:

2. Graduate Advisor-Initiated Dissolution of the Graduate advisory Committee

A Graduate Advisor may initiate termination of a student's Committee on Graduate Studies by one of two pathways:

Pathway 1: If for two consecutive semesters a student's progress is indicated by two or more committee members to be unsatisfactory *and* no committee member has indicated satisfactory performance on the Graduate Advisory Committee Meeting Progress Report form, then the Graduate Advisor may initiate proceedings for dismissal of the student from the program as outlined below.

Pathway 2: As stated in the CSUP catalog: "To remain in good academic standing, a student's graduate GPA must remain at 3.000 or better. If the graduate GPA falls below 3.000, a graduate student will be placed on probation. Students have one semester to show progress toward good standing. Probationary students with 12 or more semester hours of graduate work will be dismissed whenever progress toward good standing is not demonstrated or whenever the graduate GPA falls below 2.500. A student may take up to six hours beyond the program requirements (including repeated credits) to improve the cumulative graduate GPA to the required minimum of 3.000 at time of graduation".

Pathway 3: A Graduate Advisor may resign from a student's committee for any reason, regardless of the student's performance. In this event, the student may proceed to form a new committee as outlined in section one above. If the student is unable to form a new Graduate Advisory Committee, the faculty of biology will meet and select a replacement Graduate Advisor and committee for the student. The student will then file a new thesis or internship plan and proceed with the new course of studies as directed by the Graduate Advisory Committee. Students will have one semester to complete the formation of a new committee after which if a new committee has not been approved the student may be dismissed from the program. If, by unanimous vote, the faculty of biology rejects the formation of a new committee, or, if the student rejects the assignment of a new committee, then the director will initiate proceedings for dismissal of the student from the program as outlined below.

Pathway 4: Plagiarism, academic dishonesty of any kind, and fraudulent representation of credentials for admission are all grounds for immediate and unconditional dismissal.

Dismissal from the Program

A student who has been dismissed from the program, as outlined above, will be notified of dismissal from the program by a letter signed by the Program Director and Graduate Advisor.

As stated in the CSUP catalog: "A student may appeal dismissal by submitting a written petition to his/her program director/coordinator. This petition must provide a justification for continued registration. The program director/coordinator shall forward a recommendation through the appropriate college dean, the Dean of Graduate Studies and Research, and the Office of the Provost. The Provost or his/her designee shall make a final decision on the appeal and inform the student of that decision. Decisions by the Provost are final."

By the defense all successful students will perform at a passing level on the defense and thesis evaluation rubrics.

- What level of performance is expected of students for each criterion?

Satisfactory performance will be defined on an individual basis by the student's graduate committee. Additionally, university and program rules for satisfactory coursework and progress towards the thesis will apply as follows:

MAINTAINING GOOD STANDING IN THE PROGRAM

1. The graduate student is to remain in good standing with the faculty mentor.
2. GPA is to remain above 3.0 (4. 0 scale) in all graduate coursework.
3. The graduate student will make satisfactory progress towards the thesis or internship defense as assessed by the faculty mentor and committee.

- How are the learning outcomes communicated to department faculty and students, and to the community?

In the university catalog as quoted above, in the MS in Biology Handbook (appendix A to this document) and in BIOL 510 and BIOL 593 which are core requirements of the program.

Curriculum

- Do the courses and their objectives, in aggregate, meet the outcomes for the program (as illustrated via an attached curriculum map)?

Yes, See appendix B

- Does the curriculum provide opportunities for students to demonstrate they have learned the program outcomes?

Yes, at numerous and evenly dispersed checkpoints, see appendix B.

Assessment methods

- What assessment methods will be used to measure each of the learning outcomes?

See appendix B.

- Are descriptions of the assessment processes clear and detailed?

Yes, in the rubrics that faculty committee members and the public use to evaluate the two public seminars, committee meetings, and the defense. See Appendices A and C

- Are the assessment processes explicitly linked to the student learning outcomes?

To an extent yes, however, the biology department is currently redeveloping the assessment rubrics to more explicitly link the assessment process to the learning outcomes. The rubrics in redevelopment include:

- 1) *The Advance to Candidacy form shown in Appendix B, which is used to provide feedback to the student about the quality and defensibility of the written thesis or internship report just prior to the defense.*
- 2) *The Committee Meeting form, which is used to evaluate student learning outcomes at the 4 committee meetings during the students program.*
- 3) *The Completion form, which is used to evaluate the students final outcomes and to recommend conference of the degree.*
- 4) *The Seminar Evaluation form, used to evaluate the students public seminars.*

- Are the means of assessment commensurate with the available resources?

Yes.

- What timetable will be implemented for each method, who is involved, and who is responsible for them?

The students are evaluated at 4 committee meetings, one each semester, at the public seminar for BIOL 593 during the fall semester of the second year of study, in the advance to candidacy screening where the written work is evaluated, and at the defense. The MS director is responsible for implementing the seminar evaluations and the thesis advisor is responsible for implementing the committee meetings.

- Are multiple methods employed?

Yes as detailed above.

- Are sufficient direct measures of student learning utilized?

Yes, sufficient, direct, and generally subjective.

- Can these methods also be used for accreditation purposes?

Yes, they are representative of common practices for other MS programs.

- How are students involved in the assessment process?

They participate in all assessment activities by organizing the meetings, seminars, theses and reports. Also, they are trained in the assessment process and its expectations in BIOL 510 during their first semester of the program.

□ Assessment results

- How are assessment results evaluated?

Individually by the committee which then communicates to the student his/her progress and areas for development and improvement. Also, at the programmatic level the results will be evaluated by the director through tabulation of the rubric elements (upon their redevelopment this year).

- How are faculty and students involved in interpreting and evaluating results, and developing strategies to improve the curriculum?

Students are involved in interpreting the results at the individual level when they receive feedback from committee meetings, evaluation of thesis and report work, and seminars. Faculty will interpret the results at the individual student level and communicate them to the student. The MS Director will tabulate results at a programmatic level and periodically communicate to the faculty of biology a picture of the programs strengths and weaknesses with respect to the stated learning outcomes.

- Are the results used to help the department achieve its program outcomes?

Tabulated programmatic results will be used to make decisions about curriculum and strategies for improving weaknesses in the program aims and goals and for steering the program into the future.

- How are assessment results used to improve the curriculum and program?

For example, if students demonstrate a weakness in the work ethic outcome faculty will discuss ways to improve learning in this area, such as implementing stronger training in this area in the BIOL 510 and 5932 core courses.

- Are the results being used for budgeting and strategic planning?

A budget does not exist for CSM MS programs.

- How are results disseminated to faculty, students, advisory boards, and administrators?

Orally, however, real data that will be tabulated using the redeveloped rubrics will be presented in the oral communications.

- Are students informed about their progress toward the learning outcomes?

Yes, at committee meetings and oral presentations and on an ongoing basis by the interaction with the thesis advisor/project mentor.

□ Continuous processes

- What processes are in place to ensure that the academic program assessment plan is periodically reviewed, evaluated, and updated when appropriate?

The MS director regularly reports to the faculty of biology in regularly scheduled meetings. The MS director works in cooperation with the Assistant Provost for Assessment and Student Learning to develop and steer the plans for continual improvements in the assessment strategy for the program.

- Who is responsible for initiating and supporting the on-going process of program improvement?

The MS director and the faculty of biology share responsibility and are supported by the Assistant Provost for Assessment and Student Learning.

- Who is responsible for ensuring that results from each year are the basis for action plans for the following year?

The MS director and the faculty of biology share this responsibility.

Please call Erin Frew, the Assistant Provost for Assessment and Student Learning at 549-2207 to schedule an appointment to discuss your department's program assessment plan.

Created by Erin J. Frew, June 2009; modified January 2011

**COLORADO STATE UNIVERSITY-PUEBLO
GRADUATE PROGRAMS IN APPLIED NATURAL SCIENCES
MASTERS DEGREE IN BIOLOGY HANDBOOK 2009-10
(Edited 22 February 2011 js)**

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I. PROGRAM GOALS AND CONTACT INFORMATION

To provide students with a balanced graduate level curriculum of theory and practice in the natural sciences.

- To engage students in thesis research or graduate internships leading to scholarly presentations and publications in their discipline(s).
- To provide students with the foundation to successfully develop in their biological sciences disciplines, to perform in the workplace, in professional programs, or in doctoral programs.
- To provide opportunities for advanced studies in the natural sciences in response to regional needs, the educational professions, industry, and government agencies.

• Contact:

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Colorado State University-Pueblo
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II. VISION STATEMENT

The MS degree in biology offers students the opportunity to develop scientific research and real-world problem solving skills that will translate to enhanced career opportunities in research, industry, government and education. Graduate students work closely with a faculty mentor to produce a meaningful and significant scientific contribution within the scholarly program of the mentor (thesis plan A), or a significant internship-learning contribution in a community business or government agency under the guidance of a faculty mentor and qualified community business or agency leader (internship plan B). Each of the faculty mentors in the biology department embrace significant scholarly activities which define their scientific professionalism and it is the privilege and primary role of the graduate student to work constructively as an apprentice to the faculty mentor (Plan A), or internship leader (plan B), in achieving the degree. Under the direction of the faculty mentor and committee, students will also take selected and prescribed coursework to augment their learning and abilities to make a scholarly or Internship-learning contribution.

III. THESIS GUIDELINES (PLAN A)

The most valuable learning in the MS degree comes from the mentor-student relationship. Mentors will guide and direct students through the process of constructing a written thesis to achieve this learning. A successful thesis requires three components: *Reading* the scientific literature, *experimentation* to conduct scientific research in the laboratory, and *writing* the results of the research.

- **Reading:** Students will exhaustively read the primary literature pertaining to the research project and build a comprehension of the scientific questions, methodologies, and results which are relevant to their project. This comprehension of the literature is the basis for generating a hypothesis and experimental design of the thesis project.
- **Experimentation:** Students will conduct well planned experimentation using the scientific method to produce meaningful and significant results about specific hypotheses that they will formulate. The experimental design will be approved by the graduate advisory committee (see below).
- **Writing:** Students will write a detailed thesis describing the research project and its results. The thesis will contain the following sections:

- Title page
- Signatures page (certificate of acceptance)
- Dedication (optional)
- Acknowledgements
- Abstract
- Table of Contents
- List of tables, figures, etc.
- Text/Body
 - Introduction and hypothesis
 - Background and Significance
 - Materials and Methods
 - Results
 - Discussion
 - Conclusion
- Appendices
- References Cited

A copy of the thesis and Powerpoint presentation on CD

See section XIII for detailed formatting instructions for the thesis.

The thesis should be planned and constructed in detail well in advance of its submission. It is a university requirement that the Thesis Planning Form be filed with the graduate program director no later than before 18 credit hours has been completed. Unbound copies of the completed thesis must be submitted to the committee members 2 weeks prior to the defense.

After successful defense and revisions (see below) five copies of the thesis will be bound, signed by the committee, department chair, and program director, and delivered as follows: 2 copies for the library to be filed with Dan Sullivan, 1 for the faculty mentor, 1 for the department of biology, and 1 for the program director. The Houchen Bindery, 1-800-869-0420, email@houchenbindery.com will bind the thesis at around \$10.00/ copy. Each copy will also have attached a CD with the thesis, thesis seminar presentation, and ancillary data materials included in digital format. Additional copies may be requested for the student if desired. The Thesis Completion Form will be signed by the program director and filed with Lou Minatta in the records office for degree clearance.

IV. INTERNSHIP GUIDELINES (PLAN B)

The most valuable learning in the MS degree comes from the mentor-student relationship. Mentors will guide and direct students through the process of constructing a written Internship Report to achieve this learning. A successful Internship Report requires three components: Reading, internship activities, and writing.

- **Reading:** Students will exhaustively read the primary and other relevant literature pertaining to the internship project to build a comprehension of the scientific questions, methodologies, and background which supports the internship project. This comprehension of the literature is the basis for enhancing the learning-productivity of the internship and for writing a meaningful Internship-Learning Report.
- **Internship activities:** Students will do work on biological projects in the community that are significant in scope and content such as to warrant degree status. The activities will be determined by the graduate advisory committee (see below).
- **Writing:** Students will write a detailed Internship Report describing the internship, as well as it's its biological and learning significance. The Internship-Learning Report will contain the following sections:
 - Title page
 - Signatures page (certificate of acceptance)
 - Dedication (optional)
 - Acknowledgements
 - Abstract
 - Table of Contents
 - List of tables, figures, etc.
 - Text/Body
 - Introduction and internship-learning statement of goals
 - Background and significance
 - Environment and activities summary

Results-learning and internship outcomes
Discussion
Conclusion
Appendices
References Cited
A copy of the Report and Powerpoint presentation on CD

See section XIII for detailed formatting instructions for the report. Note that the Text/Body sections are slightly different for the thesis (described in section XIII). Internship reports should follow the outline above.

The report should be planned and constructed in detail well in advance of its submission. Unbound copies of the completed report must be submitted to the committee members 2 weeks prior to the defense.

After successful defense and revisions (see below) five copies of the internship report will be bound, signed by the committee, department chair, and program director, and delivered as follows: 2 copies for the library to be filed with Dan Sullivan, 1 for the faculty mentor, 1 for the department of biology, and 1 for the program director. The Houchen Bindery, 1-800-869-0420, email@houchenbindery.com will bind the report at around \$10.00/ copy. Each copy will also have attached a CD with the internship report, report seminar presentation, and ancillary data materials included in digital format. Additional copies may be requested for the student if desired. Lastly, the Internship Completion Form will be signed by the program director and filed with Lou Minatta in the records office for degree clearance.

In addition to the report and its defense, internship students are required to take a written comprehensive examination covering materials from their coursework in the program. The protocol for administration of the comprehensive exam is as follows:

1. The exam will be administered after completion of most of the coursework, typically near the end of the third full semester or at the beginning of the last semester of the student's program.
2. The Graduate Advisor will have the responsibility to coordinate and administer the exam.
 - A. The graduate committee members, including the graduate advisor, will be the usual contributors of exam materials.
 - B. Other members may also be selected to contribute exam materials, i.e. internship supervisors or faculty from selected graduate courses.
 - C. At least three members in total will contribute to the exam.
3. Four weeks prior to the exam, each of the selected faculty will submit to the student three literature references for review (9 references in total).
4. Each faculty member will develop and submit two to four exam questions (12 in total) relating to the prescribed literature, or selected coursework, to the graduate advisor who will administer the exam.

5. Two weeks prior to the exam, the student will be provided all twelve questions to review.
6. At the time of the exam, the Graduate Advisor will select six of the questions for the student to answer. Questions from all contributors will be represented.
7. The student will answer the questions in written essay form within a three hour period.
8. The answers will be evaluated by the faculty members on the committee and a decision will be made as to whether the exam is satisfactory or unsatisfactory (S/U).
9. Under special circumstances the committee may decide to grant the student one opportunity to retake the exam if the first attempt results in a grade of U. In this case a new exam will be developed by the committee.
10. Unsatisfactory results will result in the student's dismissal from the MS program.
11. The results will be submitted in writing to the program director and department head.

V. COMPOSITION AND FUNCTION OF THE GRADUATE ADVISORY COMMITTEE

Graduate students, with the guidance and approval of their main Graduate Advisor, will select a graduate advisory committee that will have the function of guiding and evaluating the scientific validity and quality of the student's thesis or internship progress. The committee shall also determine the coursework that each student will take. The committee will consist of the Graduate Advisor, and a pair of faculty members from the biology department, Committee Members One and Two (CM1 and CM2). When warranted, CM2 can be selected from outside of the department. For internship students, an Internship Supervisor will also be selected as a fourth committee member. The Internship Supervisor will have the role of supervising the student's internship activities in the agency that hosts the internship. After the Graduate Advisor has approved the committee membership, it will be brought before the faculty of the department of biology for approval by vote after which the Graduate Advisory Committee is charged with overseeing the completion of the student's graduate program. Exceptions to the above committee selection policy will be considered by the faculty of biology on an individual basis.

If for any reason a committee member (CM1 or CM2) is to be replaced, the formulation of the new committee will proceed as outlined above and a new approval vote will be taken by the faculty of biology to sanction the new committee. The student will then file a new degree plan, an updated thesis or internship plan, and proceed with the course of studies as directed by the new Graduate Advisory Committee.

The committee will meet no less than once per semester. It is the student's responsibility to organize the meeting of the committee in a timely manner as requested by the Graduate Advisor. The committee members will complete a Graduate Advisory Committee Meeting Progress Report form, either approving, disapproving, or approving with changes, the student's progress. The faculty mentor will summarize the results of each committee meeting in the space provided on the form, outlining the recommendations of the committee. The form will be delivered to the student, and a copy will be filed with the graduate director.

The formation of the Graduate Advisory Committee and completion of the first committee meeting will be incorporated into BIOL 510 as part of the course agenda and assessment.

VI. REPLACEMENT OF THE GRADUATE ADVISOR

In the event that the Graduate Advisor for a student's project is to be replaced, the following procedures will determine the course of action:

1. Student-Initiated Replacement of the Graduate Advisor

A student may initiate replacement of his or her Graduate Advisor by filing a written request with the program director to dissolve the Graduate Advisory Committee and replace the Graduate Advisor. The student will then have the responsibility to select a replacement Graduate Advisor, and form a new committee as outlined in section V of this handbook. After the Graduate Advisor has approved the committee membership, it will be brought before the faculty of the department of biology for approval by vote. The student will then file a new degree plan, an updated thesis or internship plan, and proceed with the course of studies as directed by the new Graduate Advisory Committee. If the student is unable, for any reason, to form a new committee within one semester of filing the request to dissolve the Graduate Advisory Committee and replace the Graduate Advisor, the director will initiate proceedings for dismissal of the student from the program as outlined below.

2. Graduate Advisor-Initiated Dissolution of the Graduate advisory Committee

A Graduate Advisor may initiate termination of a student's Committee on Graduate Studies by one of two pathways:

Pathway 1: If for two consecutive semesters a student's progress is indicated by two or more committee members to be unsatisfactory *and* no committee member has indicated satisfactory performance on the Graduate Advisory Committee Meeting Progress Report form, then the Graduate Advisor may initiate proceedings for dismissal of the student from the program as outlined below.

Pathway 2: As stated in the CSUP catalog: "To remain in good academic standing, a student's graduate GPA must remain at 3.000 or better. If the graduate GPA falls below 3.000, a graduate student will be placed on probation. Students have one semester to show progress toward good standing. Probationary students with 12 or more semester hours of graduate work will be dismissed whenever progress toward good standing is not demonstrated or whenever the graduate GPA falls below 2.500. A student may take up to six hours beyond the program requirements (including repeated credits) to improve the cumulative graduate GPA to the required minimum of 3.000 at time of graduation".

Pathway 3: A Graduate Advisor may resign from a student's committee for any reason, regardless of the student's performance. In this event, the student may proceed to form a new committee as outlined in section one above. If the student is unable to form a new Graduate Advisory Committee, the faculty of biology will meet and select a replacement Graduate Advisor and committee for the student. The student will then file a new thesis or internship plan and proceed with the new course of studies as directed by the Graduate Advisory Committee. Students will have one semester to complete the formation of a new committee after which if a new committee has not been approved the student may be dismissed from the program. If, by unanimous vote, the faculty of biology rejects the

formation of a new committee, or, if the student rejects the assignment of a new committee, then the director will initiate proceedings for dismissal of the student from the program as outlined below.

Pathway 4: Plagiarism, academic dishonesty of any kind, and fraudulent representation of credentials for admission are all grounds for immediate and unconditional dismissal.

Dismissal from the Program

A student who has been dismissed from the program, as outlined above, will be notified of dismissal from the program by a letter signed by the Program Director and Graduate Advisor.

As stated in the CSUP catalog: “A student may appeal dismissal by submitting a written petition to his/her program director/coordinator. This petition must provide a justification for continued registration. The program director/coordinator shall forward a recommendation through the appropriate college dean, the Dean of Graduate Studies and Research, and the Office of the Provost. The Provost or his/her designee shall make a final decision on the appeal and inform the student of that decision. Decisions by the Provost are final.”

VII. TEACHING ASSISTANTSHIPS

A limited number of teaching assistantships (TAs) are available on a competitive basis. Students on a teaching assistantship must enroll for a minimum of 9 semester credits of graduate work including 1 credit of BIOL 578. Teaching assistantships are awarded to students on a one semester renewable contract, with one probationary semester. Support may be available for a maximum of four semesters with continuation subject to approval and satisfactory performance. Performance of the TA in the classroom, maintenance of a 3.0 GPA, adequate progress in coursework, and demonstrated thesis progress is the basic requirement for continuation of the TA position as determined by the committee. Typical appointments require the TA to independently teach 3-4 laboratory credits under the guidance of the course instructor. Compensation is \$6,000.00/semester with tuition deducted. Students interested in a TA position should contact the department head: Helen Caprioglio, Ph.D., at (719) 549-2815, helen.caprioglio@colostate-pueblo.edu . Students must be admitted to the program by May 15 in order to be considered for teaching assistantships the following academic year.

Students that do not take formal teaching assistantships are also encouraged to do some teaching as part of their professional development during the course of the program. The organization of teaching activities is at the direction of the graduate advisor and committee.

VIII. COURSEWORK

THESIS PLAN A

Course Requirements	credits
BIOL/CHEM 510 BIOL/CHEM 510 Foundations in Graduate Studies. Use, interpretation, and discernment of the scientific literature. Use of data bases for locating literature. Basic safety in the chemistry and biology laboratory settings. Basics of scientific methodology, scientific writing, review of ethical standards in research. Extensive development of the thesis research or internship plan, degree plan,	3 hr

and committee implementation (co-taught between chemistry and biology faculty).	
MATH 550 Statistics (includes regression, ANOVA, etc.)	3 hr
<p>Methods/Technique core course to be prescribed by committee</p> <ul style="list-style-type: none"> • 540/L Molecular Genetics Molecular track • 543/L Limnology Water science track • 552/L Advanced Microscopy Cell biology track • 553/L Ecology Field biology track 	4 hr
BIOL 599 Thesis research (A/F)	6 hr
BIOL 589 Thesis Defense	1 hr
BIOL 593 Grad Seminar Required to attend all of the regular faculty seminar series and file a short report-form for duration of graduate enrollment. Enroll for credit in last year and present a seminar (currently ANS 593).	1 hr
Biology Electives (to be prescribed by the committee)	12 hr
TOTAL	30 hrs

INTERNSHIP PLAN B

Course Requirements	credits
BIOL/CHEM 510 Foundations in Graduate Studies. Use, interpretation, and discernment of the scientific literature. Use of data bases for locating literature. Basic safety in the chemistry and biology laboratory settings. Basics of scientific methodology, scientific writing, review of ethical standards in research. Extensive development of the thesis research or internship plan, degree plan, and committee implementation (co-taught between chemistry and biology faculty).	3 credits
MATH 550 Statistics (includes regression, ANOVA, etc.)	3hr
<p>Methods/Technique core course to be prescribed by committee</p> <ul style="list-style-type: none"> • 540/L Molecular Genetics Molecular track • 543/L Limnology Water science track • 552/L Advanced Microscopy Cell biology track 	4 hr

• 553/L Ecology	Field track	
BIOL 589 Graduate Internship		4 hr
BIOL 588 Internship seminar		1 hr
BIOL 593 Grad Seminar Required to attend all of the regular faculty seminar series and file a short report-form for duration of graduate enrollment. Enroll for credit in last year and present a seminar (currently ANS 593). Internship students may substitute minimum number of professional development activities for on campus seminar series if they are far afield.		1 hr
Biology Electives (to be prescribed by the committee)		16 hr
TOTAL		32 hrs

A degree (coursework) planning form must be signed by the committee and graduate director and submitted to the records office no later than after the completion of 12 credits. Usually this is a component of BIOL 510 and will be done in that course.

IX. DEFENSE

When all of the scholarly work prescribed by the MS program has been satisfactorily completed in the eyes of the faculty mentor, the student will distribute the completed thesis or internship report to the Graduate Advisor and committee members for approval or recommendations for revisions. After final revisions have been made, the student must organize a meeting of the graduate advisory committee to assess the final quality and acceptability of the coursework and thesis or internship report and to promote the student to candidacy for the MS degree. Once the above approvals are completed, the Graduate Advisor will complete the MS Candidacy and Defense Scheduling form and file it with the director along with a complete, fully edited, version of the thesis or internship report draft that will be defended. The defense may be scheduled no sooner than two weeks after the receipt of these materials by the director.

It is the final authority and responsibility of the Graduate Advisor to thoroughly assess and approve the acceptability of the student's graduate work, including the thesis or internship report, prior to permitting scheduling of the defense with the director.

The final assessment will be conducted as a defense of the scholarly work and will include the following components to be completed at the time of the defense:

1. The student will deliver a public seminar describing in detail the scholarly work that was done. The public will have an open opportunity for questions and answers regarding the work presented. The committee will grade the seminar and the grade will be entered as the final grade for BIOL 588 or 589.

2. The committee will meet with the student to further assess the scholarly work, including the thesis or report, coursework, or other. Recommendations for further editing of the thesis or internship report may be made at this time.
3. The committee will meet without the student and will make a recommendation to accept the materials, accept the materials with amendments, or deny the degree. The student will be advised of the committee's recommendations and if necessary will complete the required changes prior to submitting the required materials for graduation.
4. Revisions to the thesis or internship must be completed in a prompt and timely manner as directed by the graduate advisory committee and Graduate Advisor. Failure to comply with the prescribed timeline may be grounds for dismissal as outlined in section VI above.

The faculty of biology fully understands and supports the need for students to graduate in a timely manner and will make every effort to support student timelines for meeting their future plans upon graduation. However, a quality education is the foremost criteria that will be applied when determining the timeline for graduation and in no way will be compromised to meet externally imposed deadlines.

X. ADMISSION GUIDELINES

Admission to the program has three cornerstones:

1. Faculty mentorship
 - A. The student will determine a faculty mentor who agrees to undertake the apprenticeship of the student.
 - B. The faculty mentor will chaperone the admissions process with a letter of support for the student that briefly outlines the pending partnership.
2. Undergraduate preparation
 - A. Undergraduate transcripts will reflect satisfactory completion of coursework that reflects appropriate preparation for the specific project that is planned.
 - B. Students will have a bachelor degree except in the case of 3 + 2 students.
 - C. The cumulative undergraduate grade point average (GPA) will be at or above 3.0 (4.0 scale). Core science GPA must be above 3.0.
3. Combined General Graduate Record Examination scores will be above 1000 as well as a satisfactory score on the written component.

Decisions on admission will be determined by the biology department after all application materials are received from the admissions office.

A completed application package includes:

- Official transcripts
- Official GRE scores
- 2 letters of recommendation addressing the student's qualifications and aptitude to succeed in the program.

- A letter of support from a potential faculty mentor
- An application letter discussing research/internship interest that also explains the student's purpose for obtaining the degree
- \$35 processing fee

Application packets and further information is available at:

<http://www.gocsupueblo.com/PROSPECTIVESTUDENTS/GRADUATE/Pages/default.aspx>.

XI. MAINTAINING GOOD STANDING IN THE PROGRAM

1. The graduate student is to remain in good standing with the faculty mentor.
2. GPA is to remain above 3.0 (4.0 scale) in all graduate coursework.
3. The graduate student will make satisfactory progress towards the thesis or internship defense as assessed by the faculty mentor and committee.

XII. 3+2 DEGREE PLAN

A unique and distinct feature of our MSANS program is the 3+2 plan. The main goal of the 3+2 plan is to give the opportunity to qualified advanced-level undergraduate students to **simultaneously** pursue both the Baccalaureate (BS) and the Master of Science (MS) degrees. Talented students are thus quickly moved toward expanding their academic and scientific horizons based on the student's abilities and personal motivation.

Students in the 3+2 plan are expected to successfully complete both the BS and MS degrees by the end of their fifth year in college; thus, they must have applied and been admitted into the MSANS program by the Spring semester of their junior year (preferred) or the first 4 weeks of the Fall semester of the senior year. Students are encouraged to apply to the 3+2 program at the start of their junior year. Students applying to the 3+2 plan must have a minimum 3.0 overall GPA and a minimum 3.25 GPA in their subject emphasis area (biology, biochemistry, chemistry, or mathematics - see below).

Prerequisites:

Before being admitted to the 3+2 plan, students are expected to have successfully completed the following course work, depending on the respective emphasis areas in which they have interest:

Biological Sciences emphasis:	
BIOL 301/L	General Microbiology + Lab
BIOL 350	Genetics
BIOL 351	Adv. Genetics and Molec. Biol
CHEM 121/L	General Chemistry I + Lab
CHEM 122/L	General Chemistry II + Lab
CHEM 301/L	Organic Chemistry I + Lab
CHEM 302/L	Organic Chemistry II + Lab
PHYS 201/L	Principles of Physics I + Lab
PHYS 202/L	Principles of Physics II + Lab
MATH 221 and MATH 156	Applied Calculus and Statistics

The **application file** for admission to the 3+2 plan must include a completed application form, an undergraduate transcript, two letters of recommendation from CSU-Pueblo faculty, and satisfactory GRE scores submitted by the end of their first year of the 3+2 MSANS program. In addition students must already have regular admission status to the general biology program.

The core course requirements and all other requirements for the 3+2 plan are the same as for the regular MSANS program plan. Dual listed courses taken by the 3+2 plan students as 400 level courses prior to admission may be acceptable as electives to meet the minimum program course load requirements, with the permission of the specific course instructor. Like students in the regular MSANS program plan, students admitted under the 3+2 plan may choose either the thesis or non-thesis program option.

XIII. TIMELINE AND TIME COMMITMENT DURING THE SUMMER AND ACADEMIC YEAR

Successful completion of the MS degree in Biology requires a level of commitment and dedication that surpasses that required to earn a bachelor's degree. The measure of success is in productivity and the creation of meaningful scientific results (data and work). As such, some students earn their degrees more quickly than others. In general, students of the MS program are expected to treat their studies as a full-time endeavor, with lab or internship duties consuming roughly half time in the academic year, and full time during the summers, with 2 week's vacation time taken at a time approved by the faculty mentor. Students generally finish their MS degree in 2 calendar years, however, provisions for slower progress can be arranged in advance with the faculty mentor and committee. There is a strong expectation that students, under the direction of the faculty mentor, will publish the results of the thesis in a peer-reviewed journal.

XIV. DETAILED INSTRUCTIONS FOR FORMATTING THE THESIS: DEPARTMENT OF BIOLOGY REQUIREMENTS

1. COPIES: Present five (5) copies of the thesis to the University. The bound thesis will be distributed to each of the following: one to the MSANS Program Director, two to the University Library, one to the graduate committee chair, and one to the department. Copies will be submitted to the library (Dan Sullivan x2714) for binding. The student is responsible for all binding cost. The average is around \$8.00 per copy depending on thickness. **All title pages must have original signatures.**

2. PAPER: Use 8-1/2 x 11, 25% cotton rag, acid free (pH neutral), un-ruled paper for all copies submitted. Use one side of the page only. Check with the Book Store for the purchase of thesis paper.

3. PRINTING: Printing is the responsibility of the student but the Copy Center located in the Book Store is available. Black and white pages are \$00.07 per page and color pages are \$00.10 per page, this price is subject to change. A laser quality printer should be used for the final copies.

4. FONTS/SPACING: Acceptable fonts generated by word processing programs include, and are restricted to: Times New Roman 12 for a major text of the thesis. Ariel 10, Ariel 8, Times New Roman 12 or 10 is acceptable for tables, figures or graphs. The Title Page, Certificate of Acceptance and Dedication use Times New Roman 16 and 14 fonts. Double space the text. Only special material

may be single spaced such as figure or table titles/descriptions. See SAMPLE THESIS. Each section such as Introduction and Materials and Methods will be left- justified, Times New Roman 12, bold and underlined. Subsections such as statement of objectives or specific background topics are left justified and bold. See SAMPLE THESIS.

5. MARGINS: Left, 1-1/2 inches; top, bottom, and right, 1 inch. These are necessary to allow for binding and trimming. Do not punch holes in the margin, since holes would make binding impossible. (It is important that the margins on the thesis meet these requirements so the binding can be completed correctly.) Page numbers do not need to meet the 1" margin requirement, and are placed in the footer. **(PLEASE NOTE:** If you do not follow the appropriate margin guidelines that are included here, you might lose content when your thesis is bound).

6. TITLE PAGE: Follow in detail the attached SAMPLE THESIS in preparing the title page. Note which items are in all upper case and which are not. Note the size of print. The degree must be shown as Master of Science.

The month shown on the title page should be that in which the degree will be conferred (May, August or December). The month of the oral defense should not be shown unless the degree will be conferred that month.

The names of committee members should be typed below the signature lines with their names. For example, John Smith, Ph.D. See SAMPLE THESIS

7. ABSTRACT: An abstract is to be included with each copy of the thesis. In style, the abstract should be a miniature version of the thesis. It contain: title, purpose of study, brief research materials and methods, significant results, summary and conclusions. The abstract should not exceed one page and should be between 300-500 words. The heading of the abstract must contain the title of the thesis and the writer's name shown on the SAMPLE THESIS.

8. ASSEMBLING THE THESIS: Assemble the thesis in this order.

1. Title page
2. Signatures page (certificate of acceptance)
3. Dedication (optional)
4. Acknowledgements
5. Abstract
6. Table of contents
7. List of tables, figures, etc.
8. Text/Body
 - Introduction and Hypothesis
 - Background and Significance
 - Materials and Methods
 - Results
 - Discussion
 - Conclusion
9. Appendices
10. References Cited
11. Powerpoint presentation (optional at discretion of advisor)

12. A copy of the thesis and Powerpoint presentation on CD

9. PAGE NUMBERING: The Title Page, Certificate of Acceptance, and Dedication are not numbered (items 1-3), but preliminary pages of the thesis, that is, those preceding the text (items 4-7) are to be numbered in **Roman numerals** with the Acknowledgements (item 4) beginning with the roman numeral *iii* or *iv* depending on the presence of the Dedication. Pages of the text itself and of all items following the text (8-10) should be numbered consecutively throughout in **Arabic numbers**, beginning with number 1 on the first page of Introduction. The page numbers do not need to meet the 1" margin requirements and should be done as a footer or footnote style.

Page numbers should be placed in the **center bottom** of the page. The default placement of page numbers of word processing programs used is acceptable. Only the number should appear, **not** page 9 or the abbreviation p. 9 for example.

10. DRAWINGS: Any material which cannot be typed or computer generated should be drawn with permanent black ink in neat and workmanlike manner in heavy lines. Photographs of drawings are acceptable. Reproductions of drawings are acceptable if reproduced on the correct paper and if they are of high contrast. No press-on letters may be used.

When a graph, map, etc. is oversized, there can be a pocket in the back of the bound text to hold these oversized documents, but submission is limited (see Graduate Committee for amount), with a depth not to exceed one half inch or the paper can be folded.

All figures should appear within the text at the point where reference to them is first made.

11. PHOTOGRAPHS: Should be digital and not to exceed the margins of the text and follow the same basic guidelines at Drawings.

12. TABLES, GRAPHS AND FIGURES: Tables are to fit with the margins of the thesis. The title of the table is placed at the top of the table beginning with the word "Table" followed by an index number starting at the beginning of the thesis, followed by a brief descriptive title. See SAMPLE THESIS

Graphs: Graphs are formatted the same as tables.

Figures: Figures are images, drawings or other depictions to aid the reader. These are done similar to tables, except in that the title portion is found below the image. The word "Figure" followed by an index number starting at the beginning of the thesis, followed by a brief description of figure. The figure description though brief, should be descriptive enough to stand alone from the thesis. See SAMPLE THESIS.

13. WIDOW AND ORPHAN LINES: Format thesis so that no one line is left on the end of one page or the beginning of another. Subtitles should be grouped with associated text.

14. CITATIONS: Citations within text are cited in parentheses with the last name followed by the year then the period. Example: The green pigmentation in plant leaves is caused by photosynthesis (Smith 1956).

If two authors are present then the authors are divided by the word "and" followed by the year. Example: The green pigmentation in plant leaves is caused by photosynthesis (Anderson and Smith 1999).

If more than two authors are represented then the first is distinguished by name followed by et al. Example: The green pigmentation in plant leaves is caused by photosynthesis (Anderson, et al. 1999).

15. REFERENCES: References are done according to scientific format and appear in alphabetical order.

Journal

Davenport, D. W. 1998. Viewpoint: Sustainability of pinon-juniper ecosystems – a unifying perspective of soil erosion thresholds. *Journal of Range Management* 51:231-240.

Book

Diawara, M.M. and Trumble J.T. 1997. Linear Furanocoumarins. *In: Handbook on Plant and Fungal Toxicants*. D’Mello, JPF Ed., CRC Press, Inc., Boca Raton, chap.12.

Magazine

Posner, M. I. 1993. Seeing the mind. *Science*, 262:673-674, Oct 29.

Web Site

Johnson J. How to smoke a bison. Bureau of Land Management, Colorado. www.co.blm.gov. 17 December 2004. Accessed Nov 2010.

Interview

Smuts, Dene. (1987). Interview with the author on 4 August 1987. Cape Town. [Cassette recording in possession of author]

Newspaper

Stewart, M.T. 1988. Should privatisation prosper? SAA in the year 1990. *The Argus*: 3, May 17, 1990.

Government Publications

South Africa. Department of Home Affairs. 1980. *Guidelines for chairmen of publications committees*. Pretoria: Government Printer.

United States Department of Agriculture, Natural Resources Conservation Service. 1995. *Soil Survey of Fremont County Area, Colorado*. USDA: Government Printer.

16. SUBMISSION: Those students who will be writing a thesis in partial fulfillment of the graduation requirements must submit the thesis to the graduate committee at least two (2) weeks prior to the anticipated date of oral defense of thesis research (4 weeks prior to the submission of the final paperwork to records). The oral defense of the thesis must be completed two (2) weeks prior to completion. An approved thesis abstract must be submitted to the MS Program Director at least five (5) days prior to presentation of the defense.

After the student's graduate committee has approved the thesis, the student must submit five (5) official copies of the approved thesis to the University Library for binding through the MS Program Director and Dan Sullivan.

17. CONTENT: The content of the thesis is mainly up to the graduate committee. Below are guidelines of what is expected for each section of the thesis.

Introduction and Hypothesis: Contains all background information and significance, statement of objectives/specific aims and hypothesis. The hypothesis should be stated clearly. The objectives/specific aims should support either proving or disproving the hypothesis and should be at the end of the Introduction. See SAMPLE THESIS.

Materials and Methods: Contains all materials and methods used in narrative format. Writing should be descriptive but brief and to the point. No results or discussion should be done here.

Results: Contains analyzed data only, no raw data should be displayed. Summary tables and figures representing datasets are encouraged. These should be used to clearly display data in a short, to the point, way.

Discussion: This section should contain a detailed discussion of the results and briefly review hypothesis and objectives/specific aims of research. The hypothesis should be supported or rejected in this section and a description of how the objectives/specific aims have been met should be present.

Conclusion: This section concludes and summarizes the main points of the research. The conclusion contains a summarization of hypothesis, results, significance of research. Further research interests should be included if necessary.

END

Appendix B

Curriculum map for assessing MS in biology

Timeline:

Pre summer - none

Fall 1 – MS 510 and first committee meeting

Spring 1 – Second committee meeting

Summer 1 – none, graduate symposium could be developed for this point

Fall 2- MS 593 and third committee meeting

Spring 2 to completion – Committee meeting, thesis, defense

Summer 2 – Continuation of Spring 2

			(Symposium) ↓			
none	MS 510 Committee	Committee	none	MS 593 Committee	Committee Thesis or report Defense	
Pre- Summer	Fall 1	Spring 1	Summer 1	Fall 2	Spring 2	Summer 2

Upon completion of the MS in Biology, students will have achieved the following goals:

Mastery of the Scientific Method

Independent development and mastery of problem solving skills including experimental design, execution, critical analysis, and interpretation of the results of original scientific experimentation (thesis) or experiential learning (internship).

Components of the goal:

1. Independent development of original scientific experimentation (thesis)
Independent development of original experiential learning (internship)
2. Mastery of problem solving skills
 - Experimental design
 - Execution of experimentation
 - Critical analysis on results
 - Interpretation of results

Assessment methods:

1. BIOL 510 – Design is evaluated in class and in first committee meeting
BIOL 593 – Design is evaluated in class and in faculty reviewed seminars
Committee meetings – Design is evaluated quarterly
Thesis or report – Design is evaluated just prior to culmination
Defense – Design is evaluated at culmination
2. BIOL 510 – Skills are evaluated by in-class exercises and in first committee meeting
BIOL 593 – Skills evaluated in class and in faculty reviewed seminars
Committee meetings 1-4 – Skills evaluated
Thesis or report – Skills evaluated
Defense – Skills evaluated

Dissemination of Scientific Products

Persuasive communication and defense of significant results of original scientific investigation presented in both written and oral format at a graduate peer-professional level.

Components of the goal:

1. Developed scientific writing skills.
2. Developed oral communication skills.

Assessment methods:

1. As part of BIOL 510 students develop and submit a scientific plan that will guide their thesis or internship studies. It is evaluated by the committee as part of the course requirements at the end of the first semester in the program.

Students draft a thesis or internship report which is evaluated by the committee using a rubric prior to submission of the document for defense. The document is evaluated in final at the defense.

2. As part of BIOL 593 students develop an oral presentation representing their thesis or internship work and present it at a public forum. It is evaluated by faculty and public attendees using a rubric.

Students present a public oral defense of their thesis or internship work as a final requirement of the program. The quality of the presentation is graded by the committee and assigned as the grade for BIOL 588 (internship) or 589 (thesis).

Utilization of the Literature

Critical evaluation of an independently accessed comprehensive body of scientific literature which is project relevant and foundational in supporting and explaining research findings in both written and oral format.

Components of the goal:

1. Accessing, interpreting and applying the relevant literature in the experimental plan, thesis or internship report, and oral presentations.

Assessment methods:

1. This is assessed in the committee meetings when the student presents progress, and in the two oral presentations (BIOL 593 and the defense), and in the internship report or written thesis.

Development of a Relevant Knowledge Base

Development of intrinsically held fundamental field-specific knowledge which will be applied to explain and defend research findings at a level of mastery expected by peer-professionals.

Components of the goal:

1. Intrinsically held fundamental field-specific knowledge necessary to understand and communicate the basic foundations of the students scientific project, for example, a student doing a project involving molecular cloning of a transcription factor gene in order to evaluate the effects of the proteins over expression in yeast cell division rates would be knowledgeable about the background literature related to the transcription factor, how it relates to yeast cell division, yeast cell division, and all basic aspects pertaining to the method of molecular cloning and expression of extra genomic elements in yeast.

2. Application of field specific knowledge in developing the research project and supporting or defending and explaining its results.

Assessment methods:

1. Student knowledge will be evaluated in committee meetings by oral examination, and by examination of the thesis or internship report. In addition the knowledge base will be evaluated in the oral presentations by specific components in the rubric, i.e. “the student demonstrated a significant depth of knowledge of the subject matter”, comment and rate 1-5 1 = poor, 5 = excellent.

Professionalism and Self Responsibility

Maintain a consistent professional work ethic of independently taking the initiative and motivation to produce tangible products of a quality commensurate with peer-standards in graduate or professional schools or in the career field being pursued.

Components of the goal:

1. Work ethic is demonstrated by initiative and productivity.

2. Intellectual products of the thesis or internship are of a quality consistent with national educational standards.

Assessment methods:

1. Will be subjectively evaluated by the committee using the rubrics of the committee meeting.

2. Will be subjectively evaluated by the committee using the rubrics of the committee meeting. Publication and other dissemination (such as at national and regional meetings) shall also be taken into account.



Advance to Candidacy

Department of Biology, Master of Science in Biology Program Graduate Advisory Committee Meeting Pre-Defense Report

To be filed with the program director, student and advisor. Check: Thesis Internship 3+2

Student Name: _____ Date of meeting: _____

Title: _____

Declaration that thesis has been reviewed and is considered to be acceptable for defense (acknowledge by signing).	Defensible	Not-defensible
1. _____ Graduate Advisor		
2. _____ Committee Member 1		
3. _____ Committee Member 2		

Each committee member signs and checks the appropriate box indicating the overall evaluation. The thesis advisor summarizes the major outcomes of the meeting below, discusses it with the student, and the student signs at the bottom. When the thesis is marked defensible the student may schedule the defense. The defense is to be scheduled at the earliest one calendar week after filing this form. Completion of this form in no way infers that the thesis is complete, as necessary revisions in form and content may be required by the committee after the defense and prior to awarding the degree.

Progress Summary:

Action Plan and Deliverables before Defense:

Student signature

Date