PREFACE

The Graduate Student Handbook was written to provide graduate students with information about policies, procedures, and academic activities in the Department of Biological Sciences. Students should use the Handbook as a companion to the Florida Tech Graduate Catalog and The Graduate Program Policies and Procedures Manual and should not substitute for either of these publications. The Graduate Program Policies and Procedures Manual is available through Florida Tech's home page through URL address http://www.fit.edu/AcadRes/graduate/gradpol/. The Graduate Student Handbook is available through Biological Sciences home page at: http://www.bio.fit.edu/gradhand.pdf.

Students should read the Handbook, Graduate Catalog, and Manual thoroughly and familiarize themselves with their contents. It is the student's responsibility to be aware of policies, deadlines, dates, programs, etc. that relate to matriculation. When questions arise, the student should first ask his/her advisor before talking to anyone else.

The Handbook includes Instructions for Preparing a Proposal, Thesis and Dissertation. These instructions have been approved by the Graduate Programs Office and must be followed explicitly. The formatting requirements in this guide take precedence over all other manuals and style sheets. Do not use other theses and dissertations as guides for format. From time to time, the Graduate Programs Office will publish format or style instructions that will differ from ours. Those instructions are for students in departments that do not have their own guidelines and instructions. You will continue to follow the instructions in this manual unless told otherwise by the Department Head.

Mark B. Bush
August 2008
# TABLE OF CONTENTS

PREFACE ........................................................................................................ ii
TABLE OF CONTENTS .................................................................................. iii
LIST OF FIGURES ......................................................................................... vii

**ACADEMIC POLICIES AND DEGREE REQUIREMENTS** ............................................. 1
  QUICK REFERENCE FOR DEPARTMENT POLICIES AND PROCEDURES ...... 1
  ADMISSION TO CANDIDACY ........................................................................... 1
  ADVISOR ........................................................................................................ 1
  ADVISORY GRADUATE COMMITTEE ................................................................. 1
  ANIMAL CARE ................................................................................................. 1
  APPEAL OF GRADES ...................................................................................... 1
  AUTHORSHIP ORDER FOR PUBLISHED THESES/DISSERTATIONS ....... 1
  BIOLOGICAL RESEARCH ............................................................................. 2
  CHANGE OF ADVISOR .................................................................................. 3
  CLASSROOM MANAGEMENT .......................................................................... 3
  COLLECTING PERMITS .................................................................................. 3
  COMMITTEES .................................................................................................. 3
    Graduate Academic Steering Panel .............................................................. 3
  COMPLAINTS/GRIEVANCES ......................................................................... 4
  COMPREHENSIVE EXAMINATION ................................................................ 4
  DISMISSAL ..................................................................................................... 4
  DISMISSAL APPEAL ........................................................................................ 5
  DISSERTATION RESEARCH (BIO 6999) .......................................................... 5
  GRADES ......................................................................................................... 6
  GRADUATE STUDENT ASSOCIATION .............................................................. 6
  GRADUATE STUDENT PROGRESS FORMS .................................................... 6
  TEACHING ASSISTANTSHIPS ....................................................................... 7
  LETTERS OF RECOMMENDATION ............................................................... 7
  LICENSES ...................................................................................................... 7
  OFFICE HOURS .............................................................................................. 8
  OWNERSHIP OF RESEARCH DATA .............................................................. 8
  PERSONAL PROBLEMS ............................................................................... 8
  PLAGIARISM ................................................................................................. 8
  PROFESSIONAL CONDUCT ......................................................................... 8
  PROFESSIONAL SOCIETIES ....................................................................... 9
  PROGRAM PLAN ............................................................................................ 9
  PROGRESS TOWARDS THE DEGREE ............................................................. 9
  PROPOSAL DEFENSE .................................................................................. 9
  PUBLICATION OF THESES AND DISSERTATIONS ...................................... 9
  RESEARCH NOTEBOOK ............................................................................... 9
  RESEARCH REPORTS ................................................................................... 9
  RESEARCH SEMINAR AND DEFENSE .......................................................... 10
  SEMINARS ..................................................................................................... 10
  STUDENT ACTIVITIES .................................................................................. 10
    Aquaculture Society .................................................................................. 10
Graduate Student Association ................................................. 10
Sigma Xi .................................................................................. 10
Tri-Beta ................................................................................. 11
TELEPHONE ........................................................................... 11
THESIS DISSERTATION COMMITTEE .................................... 11
THESIS RESEARCH (BIO 5999) ............................................... 11
THESIS/DISSERTATION DEFENSE ......................................... 11
DEGREE PROGRAMS .................................................................. 11
ORGANIZATION AND ADMINISTRATION OF THE GRADUATE PROGRAM 11
GRADUATE ACADEMIC STEERING PANEL ............................ 12
PROGRAM AREAS AND RESEARCH INTERESTS ...................... 12
FULL-TIME ACADEMIC FACULTY-DEPARTMENT OF BIOLOGICAL SCIENCES ............................................................. 12
ASSOCIATE GRADUATE FACULTY AND THEIR AFFILIATIONS .... 15
DEGREE REQUIREMENTS AND PROCEDURES .......................... 16
DEGREES OFFERED ................................................................. 16
MASTER OF SCIENCE IN BIOLOGICAL SCIENCES ................. 16
  Transfer of Credits .................................................................. 17
  Selection of Thesis Advisor ...................................................... 17
  Program Plan ........................................................................... 17
  Full Time Status ..................................................................... 18
  Program Plan for Cell and Molecular Biology (Major Code 8022) 18
  Program Plan for Marine Biology (Major Code 8023) ............... 19
  Program Plan for Ecology and Conservation Biology (Major Code 8021) .... 20
  Admission to Candidacy ........................................................... 21
  Thesis Committee ................................................................... 21
  Thesis Research Proposal .......................................................... 21
  Proposal Defense ................................................................. 22
  Progress Toward the Degree ..................................................... 22
  Thesis Research ....................................................................... 22
  Preparation of Thesis ............................................................. 23
  Master's Thesis Examination .................................................. 23
  Student Progress Forms ............................................................ 24
  Recommended Sequence for Completion of M.S. Requirements .... 24
MASTER OF SCIENCE IN BIOTECHNOLOGY ............................ 25
  Admission Requirements ......................................................... 25
  Degree Requirements ............................................................ 25
  Curriculum ............................................................................. 25
MASTER'S TO PH.D. TRANSFER POLICY ................................. 26
DOCTOR OF PHILOSOPHY ....................................................... 26
  Course Requirements .............................................................. 26
  Program Plan .......................................................................... 27
  Program Plan for Cell and Molecular Biology (Major Code 9021) .... 27
  Program Plan for Marine Biology (Major Code 9021) ............... 28
  Program Plan for Ecology and Conservation Biology (Major Code 9021) .... 29
  Dissertation Committee ........................................................... 30
Changes in Committee ................................................................. 31
Comprehensive Examination ............................................................ 31
Request to Take Comprehensive Examination ........................................ 31
Ad Hoc Committees ........................................................................... 32
Administration of the Examination ......................................................... 32
Examination Structure ......................................................................... 32
Exam Evaluation ................................................................................. 33
Examination Re-Test ........................................................................... 33
Re-Test Format .................................................................................. 33
Dissertation Proposal ........................................................................... 33
Foreign Language Requirement ............................................................. 34
Admission to Candidacy for the Ph.D. ......................................................... 34
Dissertation Research ........................................................................ 34
Progress Toward the Degree ................................................................. 34
Preparation of Dissertation ................................................................. 34
Final Examination ............................................................................... 34
Recommended Sequence of Events for Completion of Ph.D. Requirements ... 35
INSTRUCTIONS FOR PREPARING A PROPOSAL, THESIS, AND DISSERTATION ................................................................. 37
INTRODUCTION ................................................................................. 37
CHOICE OF SUBJECT ......................................................................... 37
PROPOSAL PREPARATION .................................................................. 37
GENERAL INFORMATION .................................................................... 37
THESIS PREPARATION ....................................................................... 38
STANDARDIZING PAGE AND TEXT FORMATS ..................................... 38
Word Processor Specifications ................................................................. 38
Paper ................................................................................................. 38
Spacing and Indentsions ....................................................................... 38
Margins ............................................................................................... 39
Pagination .......................................................................................... 39
Placement of Page Numbers .................................................................. 39
PARTS OF THE MANUSCRIPT ................................................................ 40
Preliminary Pages ............................................................................... 40
The Text ............................................................................................. 40
Supplementary Pages .......................................................................... 40
Title Page ............................................................................................ 40
Approval Page ................................................................................... 41
Abstract ............................................................................................... 44
Dedication ............................................................................................. 44
Acknowledgments ............................................................................... 44
Table of Contents ............................................................................... 46
Text ..................................................................................................... 46
Tables and Figures ............................................................................... 48
List of Tables and List of Figures ............................................................ 50
Preparation of Figures ......................................................................... 50
Mounting Figures in the Manuscript ......................................................... 50
LIST OF FIGURES

Figure 1. Title page........................................................................................................41
Figure 2. Thesis committee approval page..................................................................42
Figure 3. Abstract page...............................................................................................44
Figure 4. Text page illustrating section headings.........................................................46
Figure 5. Percentage of stingrays engaged in the three activities: feeding, swimming, and resting within the three subhabitats: sand, seagrass, and interface.................................................................48
ACADEMIC POLICIES AND DEGREE REQUIREMENTS

QUICK REFERENCE FOR DEPARTMENT POLICIES AND PROCEDURES

ADMISSION TO CANDIDACY. A student must fulfill specific requirements for the masters (p. 21) degree or doctorate (p. 33) to be admitted to candidacy.

ADVISOR. The advisor is the faculty member with whom you will work most closely during the period of graduate study and research. The advisor will sign forms, help with the program plan, supervise the writing of the proposal, and direct your research, etc. It is imperative that you can openly discuss all aspects of your graduate progress. If your research interests change and your new interests no longer lie in the area of your advisor's expertise, then you must change advisors (see Change of Advisor). Your new advisor must have the expertise to supervise your graduate research; otherwise you will not be permitted to conduct it.

ADVISORY GRADUATE COMMITTEE. The members of this committee serve on the student's thesis or dissertation committee. For the master's degree, there are at least 3 members (p. 21) and for the doctoral degree 5 members (p. 30). The Graduate Academic Steering Panel (GASP), pp. 3, 12 must approve the composition of the Advisory Committee for balance and uniformity. All graduate students must meet yearly with their advisory committees. Since the committee must be formed in the first year of graduate training, the first meeting will be held in the first year. These meetings must include the student, the faculty advisor and all committee members. Following the meeting, the student will be responsible for sending a one page summary of the proceedings to GASP. This report should include action items discussed at the meeting and a time line. After they are checked in, reports will be placed in the student’s file. These reports will be considered a record of student progress and will be available for future meetings of the student’s committee. Failure to file a yearly report indicates a lack of progress and may result in a student being dismissed from the program.

ANIMAL CARE. Animals used in research must receive humane treatment at all times. Animals must be maintained under proper sanitary conditions and be sacrificed according to acceptable procedures. The federal government makes unannounced inspections to enforce compliance with these standards. The Institutional Animal Care and Use Committee (IACUC) must provide written approval prior to the acquisition and use of any live vertebrate animals in either teaching or research laboratories. Contact the IACUC chairperson (Dr. M. S. Grace) for further information.

APPEAL OF GRADES. Only the instructor may request grade changes. Normally, grade changes are permitted only when the instructor finds that an error was made in the computation or reporting of the final grade. The instructor cannot change the grade because the student later performs additional work or on the basis of a "retest." Changes of grade do not take effect unless approved by the Department Head and the Dean of the College of Science. If the student believes that the grading in a course was unfair or capricious, then the student should discuss this complaint with the instructor. If the complaint is not resolved after discussing it with the instructor, then the student should meet with the Department Head.

AUTHORSHIP ORDER FOR PUBLISHED THESES/DISSERTATIONS. In science, the student and advisor have traditionally co-authored the publications resulting from
thesis/dissertation research. Authorship order depends upon balancing several factors. For example, the advisor has: 1) generally developed the original research idea; 2) taught techniques, methodologies, and scientific approaches; 3) helped with the completion of the project; and 4) overseen the writing of the thesis/dissertation. In addition, the advisor often contracts and bears scientific and financial responsibility to the funding agencies for administering and successfully completing the projects. On the other hand, the student has: 1) done most of the work; and 2) contributed to the success of the project.

There are other considerations that complicate matters. A large collaborative project involves many graduate students contributing to different parts of the project over a period of months or years. Under these circumstances, the authorship order becomes more difficult to assign. For these reasons, the advisor and student can avoid future misunderstandings by candidly discussing the authorship order.

BIOLOGICAL RESEARCH. BIO 5995 deals with advanced topics in biology related to the current research interests of individual faculty. The course consists of the development, execution, documentation and evaluation of an original research project selected by the faculty member in consultation with the student. The components to be completed during the semester are as follows:

1. Selection of a research topic designed to advance knowledge in the field, and to simultaneously instruct the student in current investigation in the discipline.

2. Preparation of a list of references on the research topic, to be read and discussed during the course of the semester.

3. Design of the research project to be completed during the semester.

4. Organization of regularly scheduled meetings between student and faculty to discuss research progress and analyze relevant papers from the reference list.

5. Preparation of a paper describing the accomplishments of the research project. The paper should consist of: Title Page, Introduction, Materials and Methods, Results and Discussion, and References. The paper should clearly illustrate the research accomplishments as well as an understanding of the literature in the field. The paper must be submitted to the faculty member no later than the beginning of the last week of classes of the semester. See p. 9 for details.

6. Evaluation and critique of the paper by the faculty member and discussion of corrections and improvements.

7. Submission of a final copy of the paper to the Department no later than the Friday of finals week.

8. The grade for the course will be based on an evaluation of the student comprehension of the research topic and performance of the research, as evidenced by the quality of the student's final paper.
**CHANGE OF ADVISOR.** There are two primary reasons for changing advisors: 1) change in research interests and 2) personal or professional differences with the advisor. Regardless of the reason, the student should inform and discuss the change with the advisor. The student must also inform the GASP Committee of the intended change. If the student needs help in finding a new advisor, the student should discuss the matter with the Graduate Coordinator. During the interval, the Graduate Coordinator will take care of routine administrative matters. The student should be aware that changing advisors might involve additional coursework and will involve abandoning the original research and starting on a new project. Moreover, the change will usually delay graduation. In any event, the student must find a new advisor within one semester. However, no faculty member is required to accept a student and serve as the advisor. Failure to find an advisor will result in dismissal from the department's graduate program. If a student's advisor leaves the university, the student does not have to leave the university. Every effort will be made for the student to continue the original research if significant progress has already been made.

**CLASSROOM MANAGEMENT.** Teaching Assistants (TAs) are expected to organize and run their laboratories in a professional manner. They should deal fairly and openly with the students. The TA should use time efficiently and establish a pleasant laboratory environment to accomplish the course objectives. Because laboratories generally maintain greater informality than lectures, talking among students is acceptable within bounds. However, radios and cassette players and other distractions have no place in the laboratory.

**COLLECTING PERMITS.** Rapid development of Florida has placed heavy demands on its natural resources. Research requiring collection of organisms or environmental sampling should be designed to minimize collection impact as reasonably as is possible, and samples should be processed carefully and adequately to prevent waste. All collections must be made in accordance with legal requirements, including applicable permits and licenses.

**COMMITTEES.** Many departmental responsibilities are delegated to several standing (permanent) faculty committees. One that most directly relates to graduate students is the Graduate Academic Steering Panel.

**Graduate Academic Steering Panel.** The Graduate Academic Steering Panel (GASP) is the oversight committee responsible for the quality of the graduate program in Biological Sciences and for administering the program. GASP deals with every aspect of the graduate experience, admissions, program plan and policies and procedures.

All graduate admissions are subject to approval by the GASP. The GASP will evaluate all applicants that are rejected by any member of the admissions committee or applicants to present academic deficiencies (i.e. GPA below 32.0 for M.S. or below 3.2 for Ph.D.). Any faculty member requesting a special case student (one with obvious academic deficiencies) must provide written justification to the GASP. The department will not accept any graduate students who do not formally apply to the department, i.e. graduate students who are already admitted by other departments will not be admitted by change of major forms. The Biological Sciences department will not accept doctoral students who have failed comprehensive exams in any other doctoral program at Florida Tech or out academic institutions. The Committee also makes
recommendations to the Department Head on any changes in admission policy, which may be necessary to maintain or upgrade graduate standards.

GASP also reviews program plans, advisory committee compositions, and ensures their compliance to graduate school and departmental policies. Committee membership is listed on p. 12.

COMPLAINTS/GRIEVANCES. The department is concerned about those matters that directly affect the student's academic performance, such as dishonesty, misrepresentation of data, cruelty to animals, or any violation of professional conduct by students or faculty. The student is obliged to inform the Department Head of these infractions. Confidentiality will be honored. In addition, conduct that hampers the progress of other students will not be tolerated. If the student cannot settle the matter privately, then the problem should be discussed with the advisor or Department Head.

COMPREHENSIVE EXAMINATION. The comprehensive examination consists of a written exam administered to doctoral students who have completed their coursework. Questions are solicited from the graduate faculty from subject areas selected by the advisor and student and approved by the GASP. See pp. 31-33 for details.

DISMISSAL. A master's student must attain a 3.0 cumulative grade point average (CGPA), and a doctoral student a 3.2 in coursework required for graduation. Failure to attain the minimum CGPA specified below will result in academic dismissal. The advisor has the right to dismiss the student from his/her laboratory for lack of progress or cooperation or hampering the academic efforts of other students. (See the Graduate Policy Manual for special requirements pertaining to provisional students.)

<table>
<thead>
<tr>
<th>Master's</th>
<th>Minimum CGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester Hours Completed</td>
<td></td>
</tr>
<tr>
<td>9-17</td>
<td>2.50</td>
</tr>
<tr>
<td>18-23</td>
<td>2.70</td>
</tr>
<tr>
<td>24 or more</td>
<td>2.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Doctoral</th>
<th>CGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>below 3.0</td>
</tr>
<tr>
<td>Dismissal</td>
<td></td>
</tr>
<tr>
<td>Probation</td>
<td>*3.0&lt;3.2 (after 15 h)</td>
</tr>
<tr>
<td>Minimum satisfactory</td>
<td>3.2</td>
</tr>
</tbody>
</table>

* Any student on probation for longer than one semester is subject to dismissal.

In addition, two or more grades of "D", "F", or "U" in any course taken as a graduate student, the lack of satisfactory progress, or the hampering of the academic efforts of other students will result in dismissal.
A student may also be dismissed for conduct that violates the legal or ethical standards of the university. Examples include cheating, plagiarism, falsifying data, and forging or altering transcripts, laboratory notebooks, approval forms, etc.

**DISMISSAL APPEAL.** In all cases of academic dismissal, the Director of Graduate Programs notifies the student. The academic dismissal may be waived for educationally sound reasons by special action of the Graduate Council. A letter of appeal requesting a waiver of dismissal should be submitted to the Graduate Council through the Department Head. The letter is forwarded to the Appeals Committee of the Graduate Council for careful consideration. Upon filing a letter of appeal, the student is permitted to enroll in classes until such time as the appeal is resolved. In case of denial of the appeal, the enrollment will be canceled and all tuition refunded.

**DISERTATION RESEARCH (BIO 6999).** Only doctoral students who have been admitted to candidacy are allowed to register for dissertation research. The conditions for admission to candidacy are explained on p. 33. The student must submit a research report every semester (see p. 9 for format) except the last. The last semester the student will satisfy this requirement with the dissertation.

Once a student registers for dissertation, continuous registration in at least 6 credit hours of dissertation is required each semester until completion of the degree. Any exception to this rule (other than the semester of graduation) requires a written waiver and approval of the Department Head and Director of Graduate Programs. An example of this would be if the student were going to be away from campus during the summer and not using any Florida Tech facilities or faculty time.

Dissertation registration in the semester of graduation may be for less than 3 hours if the minimum required total number of credits specified for the degree has been met and a full-three-hour registration was completed for the preceding semester. Students who receive a waiver of the requirement to register for the preceding semester, or who did not pass the oral defense of the dissertation during the preceding semester, must register for at least one hour in the semester of graduation, even if they finish prior to the end of the fourth week of the semester. If a student anticipates finishing the dissertation early in the semester, he/she should register for 0, 1, 2 or 3 credits of dissertation until the actual turn-in date according to the following schedule.

<table>
<thead>
<tr>
<th>Turn In Date</th>
<th>Credit Hours Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>By noon, 4th Friday of the semester (not applicable for students obtaining a waiver of the registration requirement for the preceding semester or who did not pass the thesis or dissertation defense during the preceding semester)</td>
<td>0</td>
</tr>
<tr>
<td>By noon, 8th Friday of the semester</td>
<td>1</td>
</tr>
<tr>
<td>By noon, 12th Friday of the semester</td>
<td>2</td>
</tr>
<tr>
<td>Monday after the 12 Friday of the semester, or later</td>
<td>3</td>
</tr>
</tbody>
</table>
Students who must add credits will not be assessed a late fee. Graduate Programs will take care of adding the appropriate number of dissertation credits on the turn-in date. Students may register for 0 or 3 credits of dissertation. Only the Graduate Programs Office can authorize less than 3 credits if it is the semester of graduation and the minimum required number of dissertation credits specified for the degree to be awarded has been met. The turn-in date is defined as the date on which a minimum of 5 completed and signed copies of the dissertation are accepted by the Graduate Programs Office.

**GRADES.** The university uses a grading system of "A", "B", "C", "D", and "F" for its records, with corresponding quality points of 4, 3, 2, 1, and 0, respectively. There is one exception to this. Prior to the defense, grades of "S" or "U" (depending upon progress) will be assigned to BIO 5999 and BIO 6999. At the time of the actual defense, up to 6 hours of BIO 5999 will be converted to "P" or "F". A grade of "P" carries with it credit hours earned but does not affect the Grade Point Average.

A grade of "Incomplete" is given when extenuating circumstances prevent the student from completing the course requirements within the semester. Such extenuating circumstances might include: hospitalization from either illness or accident, personal tragedy in the family, or some other catastrophe. An "Incomplete" will not usually be given for reasons other than these. An "Incomplete" automatically becomes an "F" if course requirements are not fulfilled before the end of the 6th week of classes of the following semester, although the department may establish an earlier deadline if it chooses.

**GRADUATE STUDENT ASSOCIATION.** The Association includes all students working towards the M.S. or Ph.D. degree in the Department of Biological Sciences (p. 10).

**GRADUATE STUDENT PROGRESS FORMS.** All graduate students must complete the five graduate student progress forms to document their progress in the program. These are intended to assist the student in a smooth and timely manner through required coursework and research responsibilities. Please refer to the progress forms in the Appendix, pp. 63-72. Below is a summary of the progress forms and their intended use.

I. **Preliminary Conference.** The academic record and career goals of all incoming graduate students are reviewed at a preliminary conference with the advisor. Any course deficiencies or graduate transfer credits are established, and the student is helped to select courses for the first semester.

II. **Formation of Thesis or Dissertation Committee.** This form records your research committee members. Discuss with your advisor the appropriate individuals from the graduate faculty who can provide constructive input to your research project.

III. **Thesis/Dissertation Title and Proposal Approval.** This form records the title of your thesis/dissertation research proposal. It is completed and signed by all committee members immediately following your proposal defense meeting. Attach this form to your proposal as the proposal approval page before submission to the GASP.
IV. Admission to Candidacy. This form admits the graduate student to candidacy so that the research portion of the thesis or dissertation can formally begin. It should be completed by the end of the first year (master's) or by the end of the 5th semester (Ph.D.) of graduate study.

V. Approval for Thesis/Dissertation Presentation and Final Exam. This form documents preparation of the thesis/dissertation, promotes interaction with the advisor and committee members, and insures adequate lead-time for the formal presentation of your research and final exam. This form must be completed in its entirety a minimum of 2 wk before the defense date.

TEACHING ASSISTANTSHIPS. Teaching Assistantships are awarded on a competitive basis to highly qualified graduate students who have demonstrated proficiency in English and successfully completed the university training program. TA funding will be assigned based on availability of funds, departmental need for TAs in undergraduate laboratories and academic merit of the applicant. Decisions regarding TA eligibility will be reviewed by GASP. Yearly renewal of assigned TAs will be contingent upon satisfactory progress towards degree goals. Lack of progress will result in withdrawal of TA support.

In an effort to distribute these assistantships to the largest numbers of students possible, a limit is placed on each appointment. For M.S. students, eligibility for TA assignment lasts for 2 years and M.S. students may not hold a TA for more than 2 years. An M.S. student who receives a TA in their second year of studies may only hold that position for one year. Doctoral students will be allowed to hold TA positions for a maximum of five years, but will be encouraged to obtain research assistantships (with the help of their advisors) to reduce the time spent on TAs.

M.S. students who hold a TA and then upgrade to a Ph.D. do not reset their eligibility clock, i.e. if two years of TA support have been used in the M.S. phase, upon acceptance into the Ph.D. program the student would have eligibility for 3 yearly renewals of their TA (a total of five years of support in the graduate program). Students applying to upgrade from the M.S. to Ph.D., who fail the comprehensive exam may complete their M.S. degree, but will not be eligible for any further TA support.

LETTERS OF RECOMMENDATION. Students often ask their advisors and other faculty members to write letters of recommendation for prospective jobs, for further graduate study, or for admission to professional schools. Although most faculty members will write letters of recommendation, a faculty member is not required to write a letter and can refuse. Before asking for a recommendation, the student may be asked to sign the waiver on the application. If the application lacks a waiver statement, special forms are available in the departmental office. A separate waiver is required for each letter. Because the waiver ensures confidentiality, a letter accompanied by a waiver is more highly regarded and trusted than a letter without a waiver. Most faculty members will not write letters without waivers.

LICENSES. For reasons of health, safety, and professional standards, many local, state, and federal agencies and professional societies require licensing for: alcohol (Alcohol, Tobacco and Firearms); drugs (Drug Enforcement Agency); radioactive isotopes (Nuclear Regulatory Commission and Health and Rehabilitative Services); animal care (U.S. Department of Agriculture and National Institutes of Health); endangered species (Florida Fish and Wildlife Commission).
Conservation Commission and U.S. Wildlife Service). Check with your advisor to determine whether you need to be licensed to conduct your research. Failure to comply can result in loss of license for the department or entire university. In addition, the violator (student or faculty member) may be fined, imprisoned, and/or dismissed from the university (see Professional Conduct).

**OFFICE HOURS.** Faculty keeps office hours for the times when they will be available for consultations. Please respect their busy schedules, and make all appointments through the departmental secretary.

**OWNERSHIP OF RESEARCH DATA.** All data collected for the graduate degree are the property of the Florida Institute of Technology and are administered by the advisor for the Department of Biological Sciences. Although the student usually may make copies of notebooks and other data (films, videotapes, computer printouts, programs, etc.), the original data must remain with the advisor. The student will not graduate until all original data have been returned to the advisor. The student may not present these data at any meeting or publish it in any form before or after graduation without the consent of the thesis/dissertation advisor.

**PERSONAL PROBLEMS.** Sometimes the pressures of graduate school, personal, or financial problems weigh heavily on the student. Moreover, certain matters cannot be comfortably discussed with other students, friends, or the advisor. Whatever the reason, the student is urged to avail himself or herself of the free services of the Campus Ministry (674-8045 or 674-7476) and Counseling and Psychological Services (CAPS) (674-8050). The student should contact these services directly. They are open 10:00-5:00 weekdays and have 24 h hotlines. All conversations are completely confidential and remain a private matter between the student and the chaplain or counselor. If the need arises, the student can request that these services contact the department or advisor in the student's behalf.

**PLAGIARISM.** Intentional plagiarism represents copying the work of others and representing it as one's own. Plagiarism provides substantial grounds for dismissal from the university. For further information on Florida Tech's policy on plagiarism, students are advised to visit the following web site: [http://hyper.fit.edu/current/plagiarism.pdf](http://hyper.fit.edu/current/plagiarism.pdf).

**PROFESSIONAL CONDUCT.** Students and faculty are expected to conform to codes of ethics and conduct established by professionals in their fields. Serious breaches of codes such as fabrication of data and unprofessional conduct will result in dismissal.

Once the student has accepted admission into our program, he/she is subject to the ethics, professional standards and laws relating to biologists, such as state and federal licenses for endangered species, public health certification, and licenses for clinical specialties, consent forms, and proper animal care. For this reason, the student may not engage in any professional activity (for pay or otherwise) without the appropriate certification and/or approval of the advisor or Department Head. To disregard the need for approval or to engage in activities that seem either unethical or inappropriate will be cause for dismissal from the program. It is further understood that after graduation the student will not engage in any professional activity without appropriate state, federal, or professional certification, licensure, etc.
PROFESSIONAL SOCIETIES. All faculty members have joined professional societies in their specialties. Societies are important for professional development, scientific contacts, and employment opportunities. These societies hold meetings at which regular and student members present papers and posters. Some societies are responsible for certification and licensing. Check with your advisor about the one(s) that you should join.

PROGRAM PLAN. The program represents the official credit hour requirements for graduation. Changes in it because of new or canceled courses, change of advisor, etc., require approval by the GASP Committee. (see below).

PROGRESS TOWARDS THE DEGREE. Graduate students must demonstrate that they are making progress towards the degree (M.S. or Ph.D.). Students who are not making sufficient progress run the risk of losing graduate assistantships and/or of being dismissed.

PROPOSAL DEFENSE. The proposal defense is an oral exam administered by the thesis/dissertation committee and emphasizes the proposed research and related research literature. See details on pp. 22, 33.

PUBLICATION OF THESEAS AND DISSERTATIONS. Publications are professionally important for obtaining employment, promotions, grants and contracts. Although an advanced degree strengthens a person's credentials, a person who has published has additional professional achievement. A thesis/dissertation is considered to be "unpublished" until it appears as a journal article or as a chapter in a book. Graduate students are strongly encouraged to publish as often as the data justify. For practical reasons, graduate students find it easier to write manuscripts from the thesis/dissertation research while in graduate school than after graduation. After graduation, new graduates will obviously spend their time searching for jobs or devoting their fullest efforts to doing well at their new jobs.

RESEARCH NOTEBOOK. Each student must maintain a research notebook. The notebook serves as a research diary for writing down the raw data as they are collected. The notebook should always be accessible to the advisor.

RESEARCH REPORTS. The department offers 4 research courses: BIO 5995 - Biological Research; BIO 5998 - Biological Research Rotation; BIO 5999 - Thesis; BIO 6999 - Dissertation. Students must submit research reports (progress reports) to each member of the advisory committee for each research course enrolled in no later than the Friday of the last week of classes of the semester. The purpose of the thesis or dissertation report is to document, for the committee, research progress made during the semester. Committee members should evaluate the report for progress (since the last report) and for adherence to the research proposal. Any committee member may request a meeting with the student if problems surface. The student is advised to "use" their committee and should schedule meetings with individuals or the entire committee whenever problem arises or they deem it necessary. Don't wait for the committee to schedule a meeting. After the advisor and committee members have approved it, the report is graded and kept in the department's files. It is not returned to the student.

The report format follows this general outline:
  a. Title page (project title, course number, student's name)
  b. Summary/Abstract

2/4/2009
c. Introduction
d. Materials and Methods
e. Results
f. Discussion
g. Literature Cited

Pages in the report must be numbered, except for the Title page. It is recommended that students begin learning and applying the instructions for thesis and dissertations (p. 36) in the preparation of all research reports.

RESEARCH SEMINAR AND DEFENSE. All students must present a research seminar for either their thesis (p. 23) or dissertation research (p. 34) to fulfill their graduation requirement. Students should register for Biological Research Seminar (BIO 5990, 0 credit hour) in the semester they intend to graduate and then do an add/drop to BIO 5991 (1 credit hour) at the time the student actually presents the seminar.

SEMINARS. Students are required to attend all departmental seminars. Regularly scheduled departmental seminars are held every Thursday; times are posted. In addition, unscheduled seminars are held periodically.

STUDENT ACTIVITIES.

Aquaculture Society. This is an on-campus organization for students with an interest in aquaculture. It is open to any student at any grade level. The objectives of the club are to enhance the student's exposure to aquaculture beyond that experienced in normal curricular activities. Tours to various in-state facilities, attendance and volunteer staffing at state and national conventions, special demonstration projects and fish fries are examples. The society also maintains several display aquaria on campus. Meetings and activities are posted in advance.

Graduate Student Association. All students working toward the M.S. or Ph.D. degrees in the Department of Biological Sciences are members of the Graduate Student Association (GSA). Regular meeting attendance and participation in GSA sponsored events is encouraged and expected of all graduate students. Meetings are generally held every other week on Thursday afternoons immediately following the departmental seminar. The primary functions of the GSA are: to organize and sponsor a seminar or workshop series on various topics selected by graduate students; to facilitate communication among graduate students, faculty, and administration; to provide information and tours to prospective or incoming students in the Department of Biological Sciences; to provide a forum where proposals, seminars, and research ideas may be presented and discussed. In addition, the GSA sponsors an annual poster session near the end of the fall semester at which graduate students prepare and present posters of their past, current, or proposed research at Florida Tech.

Sigma Xi. Sigma Xi is the national scientific research society. Florida Tech has an authorized chapter. To join, the student must be nominated by faculty members. Sigma Xi gives grants-in-aid of several hundred dollars for successful research proposals. Deadlines for receipt of applications are 1 February, 1 May, and 1 November each year.
Tri-Beta. The Sigma Psi chapter of Tri-Beta, the national biology honor society, was chartered during the 1980-81 academic year. Announcements of activities are appropriately posted. All graduate students who were Tri-Beta members at other institutions are urged to transfer their memberships. Those who are not members of Tri-Beta are urged to join as graduate members of our local chapter.

TELEPHONE. Students may not use faculty or office telephones for making toll calls (long-distance) unless they receive prior permission from either the Department Head or advisor. Students or their friends should not ask the departmental secretaries to take messages except in emergencies or for official business. Private calls should be made from private phones or from public pay telephones.

THESIS/DISSERTATION COMMITTEE. The thesis/dissertation committee has the responsibility for general supervision of the student's research and ultimately of certifying to the Graduate Programs Office that an acceptable thesis or dissertation has been submitted and all degree requirements are completed. The committee also has the general responsibility for monitoring the student's progress. For the master's degree, there are at least 3 members (p. 21) and for the doctoral degree, 5 members (p. 30). The GASP (p. 12) must approve the composition of the committee for balance and uniformity.

THESIS RESEARCH (BIO 5999). The student must have at least a 3.0 CGPA for formal coursework and an approved thesis proposal on file before registering for thesis (see p. 22 for details). The student must submit a research report to the thesis committee every semester (see p. 9 for format) except the last for which the thesis satisfies the report requirement.

THESIS/DISSERTATION DEFENSE. Defense of the thesis/dissertation consists of a seminar at which the student presents his/her research in its entirety followed by an oral exam conducted by the student's committee. See pp. 23 (M.S.) and 34 (Ph.D.) for details.

DEGREE PROGRAMS

The Department of Biological Sciences offers opportunities for advanced study and research leading to the Master of Science and the Doctor of Philosophy degrees in Biological Sciences. The degree programs are organized with emphasis in cell and molecular biology, ecology and conservation biology, and marine biology. The master's or Ph.D. degree is awarded to candidates who have 1) displayed an in-depth understanding of the subject matter and 2) demonstrated the ability to make original contributions to knowledge in their fields of specialty.

ORGANIZATION AND ADMINISTRATION OF THE GRADUATE PROGRAM

The graduate program in the Department of Biological Sciences is administered through the Graduate Academic Steering Panel (GASP). The GASP is comprised of 5 members selected from the Department's graduate faculty who are active in the graduate program. The GASP recommends admission of students into the program, sets degree requirements, and recommends students for admission to candidacy for the M.S. and Ph.D. degrees. Once the student is advanced to candidacy, the thesis or dissertation committee, chaired by the student's thesis or dissertation advisor, has the responsibility of monitoring the student's progress through the program in a timely manner.
The Staff Assistant is the person who actually does a lot of the work and knows the specifics of where the students stand in their program. The Staff Assistant keeps the records on students and sees that paper is processed in a correct and timely manner. Most questions concerning routine procedures should be addressed to the Staff Assistant.

The following individuals currently administer the Department of Biological Sciences graduate program:

**GRADUATE ACADEMIC STEERING PANEL.**
Dr. Alan C. Leonard, Chairperson
Dr. Jon Shenker
Dr. David J. Carroll
Dr. Michael S. Grace
Dr. Robert van Woesik

**Staff Assistant**
Ms. Dee Dee Van Horn

**PROGRAM AREAS AND RESEARCH INTERESTS**

Although there are no formal administrative divisions of biology within the Department of Biological Sciences, the following research areas are recognized: (1) Aquaculture, (2) Biochemistry and Molecular Biology, (3) Cell Biology and Molecular Genetics, (4) Ecology and Conservation Biology, (5) Marine Biology, (6) Neurobiology, (7) Invertebrate Zoology, (8) Plant Physiology and Plant Tissue Culture. A student ordinarily will select one of these programs as the major area of interest. However, graduate education is highly individual, and a student may pursue programs that cross two or more of these areas.

**FULL-TIME ACADEMIC FACULTY-DEPARTMENT OF BIOLOGICAL SCIENCES.**

Mark B. Bush, Ph.D.
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Paleoecology
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mailto:mbush@fit.edu

David J. Carroll, Ph.D.
Associate Professor of Biological Sciences
Signal Transduction at Fertilization
Developmental Biology of the Sea Urchin
Initiation of Calcium Release at Fertilization
mailto:dcarroll@fit.edu

Michael S. Grace, Ph.D.
Associate Professor of Biological Sciences
Biological Detection Systems for Electromagnetic Spectral Signatures
Circadian Oscillators in Cultured Mammalian Retina
Mechanisms of Infrared Detection in Boid and Crotalid Snakes
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DNA-Protein Interaction in Living Cells
Bacteria Associated with Antarctic Marine Sponges
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Population and Community Ecology of Marine Benthos
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Lisa K. Moore, Ph.D.
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Retinal Cell Biology and Electrophysiology
Physiology and Ion Channel Structure/Function
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John G. Morris, Ph.D. \textit{Professor Emeritus}
Associate Professor of Biological Sciences, Retired
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Habitat Analysis of Rare, Threatened, and Endangered Species of Florida
Biology of Marine Mammals
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DNA Repeat Instability Associated with Genetic Neurodegenerative Disease
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Physiological and Behavioral Mechanisms Responsible for Food Capture
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Reproduction and Ecology of the Florida Applesnail
Physiological Ecology of Crustaceans
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Coral Reef Community Structure and Diversity
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Plant Tissue Culture
Studies on the Formation of Organized Tissues from Cell Cultures

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Amyloid Fiber formation
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ASSOCIATE GRADUATE FACULTY AND THEIR AFFILIATIONS.

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Richard Paperno, Ph.D.
Research Administrator, Florida Marine Research Institute
Early Life Histories of Fishes
DEGREE REQUIREMENTS AND PROCEDURES

DEGREES OFFERED. There are three graduate degrees offered through the Department of Biological Sciences: the Ph.D. and M.S. in Biological Sciences and the M.S. in Biotechnology. Both the Ph.D. and M.S. in Biological Sciences require the preparation and defense of a thesis or dissertation. The M.S. in Biotechnology is a non-thesis master’s degree requiring an internship in an industrial laboratory or biotechnology firm. Although not necessary, it is encouraged to obtain the M.S. degree before starting the Ph.D. program.

MASTER OF SCIENCE IN BIOLOGICAL SCIENCES. The Master of Science degree in Biological Sciences can be earned in one of three major areas: ecology, marine biology, or cell and molecular biology. The purpose of each option is to prepare the student for a professional career or for further graduate study. This goal is achieved through a balance of coursework and research activities. Each of the eight research interest areas listed on p. 12 falls into one of these three major areas.

The Master of Science degree requires the successful completion of at least 34 semester hours of graduate credit, which must be approved by the GASP. These 34 credit hours will be subject to the following conditions:

1. A minimum of 18 semester hours of formal coursework must be completed within the university or by transfer credit. This total may include up to 6 hours of approved 4000-level undergraduate coursework.

2. An additional 16 hours of graduate credit as approved by the GASP must be completed. This total may include 3 hours of Biological Research (BIO 5995) or Biological Research Rotation (BIO 5998). BIO 5995 and BIO 5998 are, however, not requirements.
and the student is permitted to substitute with formal coursework. The GASP must approve more than 3 hours of BIO 5995 or BIO 5998. The student must also complete up to 6 hours of Thesis in Biological Sciences (BIO 5999) and enroll in Biological Research Seminar (BIO 5991) for 1 credit as part of this total. Once started, continuous enrollment in 3 semester hours of thesis is required until all requirements for the degree are satisfied, but only 6 semester hours may apply to the degree.

3. Enrollment in Biological Sciences Seminar (BIO 5990) is required each semester. Exceptions may be made for students unable to attend seminar on a regular basis due either to employment or research obligations at sites remote to campus. The Department Head of Biological Sciences must approve requests for permission to not register for BIO 5990.

Summary of Program Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal Coursework</td>
<td>18-27</td>
</tr>
<tr>
<td>Biological Sciences Seminar (every semester except last)</td>
<td>0</td>
</tr>
<tr>
<td>Biological Research Seminar* (last semester)</td>
<td>1</td>
</tr>
<tr>
<td>Biol. Res. and/or Biol. Res. Rotation</td>
<td>0-9</td>
</tr>
<tr>
<td>Thesis (maximum)</td>
<td>6</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td>34</td>
</tr>
</tbody>
</table>

* taken concurrently with the last semester of thesis

Transfer of Credits. Students matriculating with a B.S. or B.A. degree may receive up to 12 semester credit hours of transfer credit provided the courses are eligible for graduate credit at the institution where they were taken and they were not used to complete requirements for the undergraduate degree. Classes taken at Florida Tech or other universities are not eligible for transfer credit if a grade of "C" or lower was earned.

All transfer credit to be applied to the M.S. program in Biological Sciences must have been earned within 7 yr immediately preceding the date of matriculation of the student into the program. Exceptions may be approved upon the recommendation of the thesis advisor and with the approval of the GASP and Graduate Council.

Selection of Thesis Advisor. The thesis advisor must be a member of the Graduate Faculty or Associate Graduate Faculty in the Department (see pp 12-16). New graduate students must have selected an advisor and been accepted into a laboratory before coming to Florida Tech. Only students with advisors are permitted to register for courses. The thesis advisor serves as the chair of the thesis committee.

Program Plan. The student and his/her thesis/dissertation advisor collectively construct and submit a Program Plan to the GASP for review and approval. The Program Plan includes the name of the advisor and a list of all courses to be counted toward the M.S./Ph.D. (see Appendix for Program Plan form.) Each graduate student is required to have an approved program plan on file no later than one month prior to completion of 9 semester credit hours of graduate coursework. Failure to submit the program plan on time will result in a "hold" being place on the student's registration. See section 1.3.1 of the Graduate Program’s Policies and Procedures Manual.
Students may pursue one of three Program Plans depending upon their field of interest. Each Program Plan consists of four parts: (1) Core Curriculum (required of all students in that program); (2) Seminars; (3) Electives; and (4) Research and Thesis. Students must have the prerequisite for any core courses they select; otherwise they must take prerequisites as deficiencies. Core courses are essential to the discipline being studied by the student and should not be considered deficiencies.

Full Time Status. Eligibility requirements for scholarships and student loans often require the recipient to be a full time student at Florida Tech. To be considered full time, a graduate student must be enrolled for 9 credits of formal course work. When students register for a research course, the university’s expectation is that they will work full time toward completion of their degree. Therefore, a 3 credit hour registration in any one of the following research courses constitutes full time status:

- BIO 5995 Biological Research
- BIO 5997 Industrial Internship (6 hours)
- BIO 5998 Biological Research Rotation
- BIO 5999 Thesis in Biological Sciences
- BIO 6999 Dissertation

Program Plan for Cell and Molecular Biology (Major Code 8022).

Core Curriculum
- BIO 5501 Cell and Molecular Biology (3 credits)

Seminars
- BIO 5990 Biological Sciences Seminar (0 credit)
- BIO 5991 Biological Research Seminar (1 credit)

Electives
- BIO 5080 Mechanisms of Biological Clocks (3 credits)
- BIO 5502 Molecular Biology of Signal Transduction (3 credits)
- BIO 5515 Pharmacology and Drug Design (3 credits)
- BIO 5521 Regulation of Animal and Plant Development (3 credits)
- BIO 5522 Bioinformatics, Genomics and Proteomics (3 credits)
- BIO 5530 Molecular Biology (3 credits)
- BIO 5535 Current Topics in Biotechnology (3 credits)
- BIO 5537 Applied Biotechnology (6 credits)
- BIO 5539 Microbial Biotechnology (3 credits)
- BIO 5545 Growth and Division of Cells: Prokaryotes (3 credits)
- BIO 5546 Growth and Division of Cells: Eukaryotes (3 credits)
- BIO 5570 DNA Structure and Function (3 credits)
- BIO 5575 Biology of Cancer (3 credits)
- BIO 5576 Molecular Genetics (3 credits)
- BIO 5585 Protein Structure and Function (3 credits)
- BIO 5600 Advanced Plant Physiology (3 credits)
- BIO 5605 Plant Cell Studies (3 credits)
BIO 5725 Pathogenic Bacteriology (3 credits)
BIO 5815 Molecular Studies of Marine Biodiversity (3 credits)

(See also electives and core curriculum for Marine Biology and Ecology and Conservation Biology programs for additional choices.)

Research and Thesis
BIO 5995 Biological Research (3 credits)
BIO 5998 Biological Research Rotation (3 credits)
BIO 5999 Thesis in Biological Sciences (3 credits)

Program Plan for Marine Biology (Major Code 8023).

Core Curriculum
BIO 5028 Design and Analysis of Ecological Studies (4 credits) or
BIO 5075 Multivariate Analysis in Biology (3 credits)

Seminars
BIO 5990 Biological Sciences Seminar (0 credit)
BIO 5991 Biological Research Seminar (1 credit)

Electives
BIO 4515 Ecology of Coral Reefs (3 credits)
BIO 4517 Modeling for Ecology and Biology (4 credits)
BIO 4710 Marine Biology (4 credits)
BIO 4720 Marine Ecology (4 credits)
BIO 5005 Comparative Biology of Invertebrates (3 credits)
BIO 5022 Coral Reef Ecology (3 credits)
BIO 5025 Ecology of Salt Marsh and Mangrove (3 credits)
BIO 5036 Exploration of Animal Behavior
BIO 5037 Navigation and Orientation of Marine Animals (3 credits)
BIO 5038 Behavior and Sensory Biology of Fishes (3 credits)
BIO 5042 Feeding Ecology of Fishes (3 credits)
BIO 5055 Echinoderm Biology (4 credits)
BIO 5060 Biology and Ecology of Seagrasses (3 credits)
BIO 5065 Natural History of the Indian River Lagoon (4 credits)
BIO 5085 Biological Imaging (3 credits)
BIO 5090 Natural History and Management of the Upper St. Johns River (3 credits)
BIO 5120 Ecology of Tropical Marine Communities (3 credits)
BIO 5140 Coral Ecology (3 credits)
BIO 5420 Pre-Columbian Ecosystems (1 credit)
BIO 5421 Neotropical Archeoecology (3 credits)
BIO 5510 Current Topics in Ecology (3 credits)
BIO 5630 Sensory Biology (3 credits)
BIO 5813 The Biology of Sea Turtles (3 credits)
BIO 5815 Molecular Studies of Marine Biodiversity (3 credits)
ENS 5800 Limnology 1 (3 credits)
ENS 5801 Limnology 2 (3 credits)
OCN 5102 Marine Phytoplankton (3 credits)
OCN 5103 Marine Zooplankton (3 credits)
OCN 5104 Marine Benthos (3 credits)

(See also electives and core curriculum of Cell and Molecular Program and Ecology and Conservation Biology Program for additional choices.)

Research and Thesis
BIO 5995 Biological Research (3 credits)
BIO 5998 Biological Research Rotation (3 credits)
BIO 5999 Thesis in Biological Sciences (3 credits)

Program Plan for Ecology and Conservation Biology (Major Code 8021)

Core Curriculum
BIO 5028 Design and Analysis of Ecological Studies (4 credits) and
BIO 5075 Multivariate Analysis in Biology (3 credits)

Seminars
BIO 5990 Biological Sciences Seminar (0 credit)
BIO 5991 Biological Research Seminar (1 credit)

Electives
BIO 4515 Ecology of Coral Reefs (3 credits)
BIO 4517 An Introduction to Modeling for Ecology and Biology (4 credits)
BIO 5017 Tropical Plant Community Ecology (3 credits)
BIO 5023 Field Ecology 3 (3 credits)
BIO 5024 Field Ecology 4 (3 credits)
BIO 5033 Paleoecology (4 credits)
BIO 5040 Marine Mammalogy (4 credits)
BIO 5042 Feeding Ecology of Fishes (3 credits)
BIO 5060 Biology and Ecology of Seagrasses (3 credits)
BIO 5065 Natural History of the Indian River Lagoon (4 credits)
BIO 5070 Physiological Ecology (3 credits)
BIO 5085 Biological Imaging (3 credits)
BIO 5090 Natural History and Management of the Upper St. Johns River (3 credits)
BIO 5120 Ecology of Tropical Marine Communities (3 credits)
BIO 5140 Coral Ecology (3 credits)
BIO 5420 Pre-Columbian Ecosystems (1 credit)
BIO 5421 Neotropical Archaeoecology (3 credits)
BIO 5510 Current Topics in Ecology (3 credits)
ENS 4010 Geographical Information Systems (3 credits)
ENS 5001 Global Environmental Problems and Solutions (3 credits)
ENS 5701 Environmental Regulation and Impact Assessment (3 credits)
OCN 5204 Marine Pollution (3 credits)
OCN 5801 Coastal Systems Planning (3 credits)
OCN 5803 Legal-Environmental Relationships (3 credits)
Research and Thesis

BIO 5995 Biological Research (3 credits)
BIO 5998 Biological Research Rotation (3 credits)
BIO 5999 Thesis in Biological Sciences (3 credits)

Admission to Candidacy. A graduate student becomes a Degree Candidate by satisfying the following requirements:

1. Removal of all specified course deficiencies
2. Completion of at least 9 hours of graduate courses in good standing (as described by the academic dismissal regulations of the Graduate School)
3. Approval of a Program Plan by the GASP

The student then completes Progress Form "IV. Admission to Candidacy" (see Appendix).

Thesis Committee. The thesis committee has the responsibility for general supervision of the student's research and ultimately of certifying to the Graduate Programs Office that an acceptable thesis has been submitted and that all degree requirements are completed. Although the thesis advisor provides day-to-day guidance to the student, all members of the committee are available for consultation, and the student should feel free to ask for advice. The thesis committee also has the general responsibility for monitoring the student's progress.

The thesis committee consists of a minimum of three members: two from the graduate faculty of the Biological Sciences Department (of which at least one must be a full-time faculty member) and one a full-time graduate faculty member from another degree-granting department. Associate Graduate Faculty from the Florida Fish and Wildlife Conservation Commission, Harbor Branch Oceanographic Institution, and the Smithsonian Marine Station at Fort Pierce can serve as members or chairs of committees. As members of the Department of Biological Sciences, Associate Graduate Faculty cannot serve as outside members. Students should complete and submit Progress Form "II. Formation of Thesis or Dissertation Committee" (see Appendix). Changes to the Committee, after the thesis proposal has been approved and accepted, are not permitted.

Thesis Research Proposal. The thesis proposal serves the purpose of explaining the intended research in sufficient detail for the thesis advisor and thesis committee to ensure that the proposed research meets acceptable scientific standards. The thesis committee will evaluate the scope, experimental design, statistical methods, originality, feasibility, and significance of the research. If the research drastically changes direction or emphasis, the student must file an amendment to the proposal or rewrite the proposal. In either case, the entire thesis committee must review the amended or new proposal.

The proposal follows the general format described below:

a. Title page (project title, course number, student's name)
b. Introduction, including a review of the literature
c. Description of the goals of the proposed research
d. Hypotheses to be tested
e. Materials and methods
f. Projected collection and analysis of results
g. Time line
h. Budget
i. References in full bibliographic form (see pp. 52-54)

Once the proposal is acceptable to the advisor, the student should distribute copies of the proposal to the thesis committee and schedule a meeting time at least two weeks later.

Proposal Defense. The proposal defense is a research oriented oral exam that emphasizes the proposed research and related research literature. The thesis committee's responsibility is to evaluate the intellectual preparedness of the student, the scientific merit of the proposed research, and to insure that appropriate facilities, expertise and resources are available to successfully conduct the research. A timetable of milestones is also discussed. When the oral exam is successfully completed and the thesis proposal has been approved by the thesis committee, a signed copy of Progress Form "III. Thesis/Dissertation Title and Proposal Approval" (see Appendix) is attached to the proposal as the approval page. After approval of the proposal, a student may then register for thesis research (BIO 5999) providing the GPA for formal coursework is 3.0 or greater.

Progress Toward the Degree. All students are expected to make reasonable progress toward the degree. Once the thesis proposal is filed and research begins in earnest, a progress report is required each semester, until graduation, describing methodologies used, data collected, problems encountered, and plans for the following semester. The report is distributed to the thesis advisor as well as to each member of the thesis committee for review. Any member of the committee may request a meeting with the student for purpose of further discussing the report. A copy of the graded report ("S" or "U") is forwarded to the GASP and becomes part of the student's permanent file. This evaluation process must be completed and the report forwarded to the GASP by the Friday of finals week. (See format for report on page 9.)

If satisfactory progress has not been made (a grade of "U") or the thesis is not completed within 2 yr of submitting the thesis proposal, the results of a review by the thesis committee will be presented with recommendations to the GASP. The GASP will decide what actions, if any, are required and may transmit its recommendations through the Department Head to the Graduate Programs Office.

Thesis Research. Students should pursue research vigorously and with constant consultation with the advisor. The research should be original and significant. During the period of thesis research, the student should meet periodically with the advisory committee together or with the members separately to discuss thesis progress. The student, advisor and committee will decide on the frequency and format of such meetings.

Students who are engaged in thesis work must continuously register for 3 semester credits of BIO 5999, Thesis in Biological Sciences, each semester until graduation. For each thesis course, the student will receive either an "S" (satisfactory progress) or a "U" (unsatisfactory progress) grade. "U" grades will not be changed and will remain on the transcript.
but will not be used in computing the student's cumulative grade point average. When the thesis is accepted, 6 credits of "S" grades will be assigned P (Pass) as determined by the unanimous approval of the advisory committee.

**Preparation of Thesis.** Great care should be taken in the preparation of the thesis. The writing should be clear and grammatically correct. Methods, results, and conclusions should be described thoroughly. Data should be analyzed carefully as to significance. The format for the thesis must follow the example given in this handbook (see pp. 36). The thesis should be written on a computer/word processor and printed with a laser printer. Ink jet and dot matrix printers are not acceptable.

Preliminary copies of the thesis should be submitted to the advisory committee at least 4 weeks in advance of the proposed date of the final oral examination. Moreover, the candidate cannot defend the thesis until the thesis is generally acceptable to each committee member prior to the scheduling of the final oral examination. Thus, the student and advisor must discuss the corrections and revisions in the thesis with each committee member to determine whether the thesis is ready for the defense. Under no circumstances will the exigencies of forthcoming employment or other personal circumstances shorten the thorough and critical appraisal of the thesis by the thesis committee.

**Master's Thesis Examination.** When the thesis is near final form, it is approved by the thesis advisor for circulation to the thesis committee. The thesis committee must receive the complete thesis 4 weeks before the anticipated defense date. The student should consult with the thesis committee about the thesis content and make changes and corrections in a timely fashion. When all members of the committee agree that the thesis is ready to be defended (that is, the thesis meets the committee's requirements as to form and substance), the thesis defense may be scheduled. Two forms must be submitted to schedule the final thesis defense. First, a completed Progress Form "V Approval for Thesis/Dissertation Presentation and Final Exam" (see Appendix) is submitted to the GASP early enough that the Graduate Program’s 2-week deadline for final exam announcements can be met. Form V is also required to schedule the research seminar. Once Form V is approved, the "Notice of Thesis or Dissertation Defense and Oral Examination" form (see Appendix) is prepared by the Administrative Secretary and submitted to the Graduate School. This form must be in the Graduate School Office a minimum of two weeks prior to the exam.

The master's examination is a defense of the thesis consisting of two parts: a seminar and final oral exam. The first is a public seminar that is open to all faculty and students. The thesis advisor is responsible for scheduling (time and place) and for posting notices of the seminar. At the seminar, the student presents his/her research in its entirety and fields any questions and comments from the general audience. The second part of the defense, the final oral exam, is scheduled for a date following the seminar. The student meets privately with the thesis committee and any graduate faculty who wish to attend. The student answers any questions or suggestions on the research that the faculty may have about the completeness of the thesis. Once the thesis committee unanimously approves the thesis, the thesis advisor submits the master's Examination Report form (see Appendix) to the Graduate Programs Office, notifying them of the successful completion of the exam and that all degree requirements have been met.
After successfully defending the thesis, the student must prepare the thesis in final form and submit it to the thesis committee and the Department Head for final approval and signing. The Department Head should receive the thesis at least 3 days before the end of the semester. Instructions for submitting the completed thesis are available from the Graduate Programs Office.

If the student fails the thesis examination (i.e., the committee is not unanimous in its opinion of the thesis or the student's performance), the exam must be retaken after a reasonable length of time has been spent in preparing for re-examination. The thesis committee decides what constitutes a "reasonable length of time," given that the re-examination is conducted within 3 mo of the initial exam. The student's thesis committee will determine the form that the re-examination will take, which will depend on the extent of failure. Failure of the re-examination will result in dismissal from the program.

**Student Progress Forms.** The student will receive a packet of student progress forms at his/her first meeting with the thesis advisor. This consists of 5 forms that track the student's progress towards the master's degree. The forms include:

I. Preliminary Conference
II. Formation of Thesis or Dissertation Committee
III. Thesis/Dissertation Title and Proposal Approval
IV. Admission to Candidacy
V. Approval for Thesis/Dissertation Presentation and Final Exam

Each form must be completed and approved by the GASP in sequence.

**Recommended Sequence for Completion of M.S. Requirements.** The following list summarizes landmarks of progress that should be followed as closely as possible.

1. Select thesis advisor and be accepted into a research laboratory.
2. Arrive at Florida Tech.
3. Meet with thesis advisor for preliminary conference, selection of courses for the first semester of study, and completion of Progress Form I; submit to GSC.
4. Prepare and submit a Program Plan to GSC for approval.
5. Complete requirements for admission to candidacy.
6. Complete Progress Form II, and submit to GSC.
7. Select thesis committee and submit Progress Form III to GSC for approval. Form III includes a title and brief description of proposed research.
8. Prepare thesis proposal and defend before the thesis committee. Submit Progress Form IV with approved proposal to GSC.
9. Complete classes.
10. Complete research.


13. Schedule seminar and final examination with the Graduate School.

14. Obtain approval of the thesis committee and Department Head of thesis in final form.

15. Submit 5 copies of the completed and approved thesis to the Graduate Program's Office.

16. Check out from advisor's laboratory, departmental office and the stockroom; thesis advisor will notify GSC that all data have been submitted and equipment returned.

**MASTER OF SCIENCE IN BIOTECHNOLOGY.** The Master of Science in Biotechnology incorporates our strengths in marine biology, ecology, natural products chemistry, molecular biology and biochemistry to provide a path for students who aspire to learn biotechnology and earn jobs in industry but who are not interested in a traditional thesis-based master's degree. The program emphasizes those areas of biotechnology related to microbiology, natural products chemistry, and molecular biology most favored by industry with a particular focus on the marine environment.

Rather than doing thesis research, students in this program will have the opportunity to include internships in industrial laboratories as part of their degree training. This program provides for a well-trained, master's level technician with strong communication skills.

**Admission Requirements.** Prospective students must have a B.S. degree in biology, chemistry, biochemistry or a related field. Applicants deficient in organic chemistry, genetics, biochemistry, and microbiology will be required to take these undergraduate courses prior to starting the Master of Science in Biotechnology program.

**Degree Requirements.** The non-thesis option requires the satisfactory completion of 33 credit hours, including a maximum of 27 credit hours of formal courses (6 credit hours of research may substitute for 6 credits of formal course work), seminars (BIO 5990) and up to 12 credit hours of industrial internship (BIO 5997) and/or summer laboratory experience (BIO 5537) at Florida Tech. A project report on the research experience is written, presented and defended before a committee. The composition of the committee will be similar to the master’s degree committee. The committee may ask questions relating to previous coursework.

**Curriculum.** The adviser assists the student in devising a program of study that is approved by the Graduate Academic Steering panel and the department head. The student must complete courses appropriate for the option. These can be chosen from the offerings of any academic unit in the College of Science, College of Engineering, College of Psychology and Liberal Arts, and College of Business.

Summary of Program Requirements
Formal Course Work  21-27
Biological Science Seminar 0
Research (Bio., Chem., CS, etc.) 0-6
Internship or summer laboratory experience 6-12

MASTER’S TO PH.D. TRANSFER POLICY Any current Master’s student wishing to upgrade to the Ph.D. must fulfill the following conditions: 1) the MS student must reapply to the department for a slot in the Ph.D. program; 2) a supportive letter must be sent to the GASP stating that the student has been fully counseled on the repercussions of the switch to the Ph.D. program including the automatic loss of a TA held as an MS student and that the transfer is unanimously supported by the thesis committee; 3) the student must have demonstrated sufficient progress that they would have completed the MS degree in a timely manner and with superior academic performance as determined by the GASP; 4) the student’s transfer must be approved by the GASP; 5) the upgraded student must then pass the doctoral qualifying exam within the appropriate time for a doctoral student beginning a program coincidently with the start date of the student’s master’s program (window opens 3rd semester and closes at end of 5th semester). Master’s students contemplating transferring to the Ph.D. program must do so early in their 2nd year of residence; otherwise, the comprehensive exam deadlines will be missed. It is recommended that a student complete the Master’s program before making the transfer if there is a danger of missing the comprehensive exam deadlines.

DOCTOR OF PHILOSOPHY The purpose of the Ph.D. program is to train students for careers in research and teaching. Demonstration that the candidate has achieved the appropriate level of knowledge is submission of a dissertation, which should be a major contribution in the field, indicating not only that the individual has a mature understanding of the particular field but also that the individual can design and execute original studies.

The Department of Biological Sciences offers opportunities for advanced study and research leading to the Doctor of Philosophy degree in Biological Sciences. The degree program is currently organized with an emphasis in Cell and Molecular Biology, Ecology and Conservation Biology, and Marine Biology. The Ph.D. degree in Biological Sciences is awarded to candidates who have 1) displayed an in-depth understanding of the subject matter and 2) demonstrated the ability to make an original contribution to knowledge in their field of specialty.

All prospective students must have a B.A. or a B.S. from an accredited university and a minimum GPA of 3.0 in all undergraduate coursework. An applicant with a graduate degree must have a minimum GPA of 3.2 for all graduate coursework. Entering students should have a GRE (analytical and verbal) score of no less than 1000. Exceptions can be made in cases with strong justification (e.g., high GPA and/or extensive research experience). Applicants whose native language is not English must score at least 550 on the TOEFL and 230 on the TSE exam.

Course Requirements. (Applicable to students who begin FA06 or later) The doctoral degree requires a minimum of 73 semester hours beyond the baccalaureate degree. The curriculum consists of 1) at least 42 semester hours of coursework and 2) a maximum of 30 semester hours of Dissertation in Biological Sciences (BIO 6999, 3 credit hours). Biological Sciences Seminar (BIO 5990, 0 credit hours) is required each semester, and Biological Research Seminar (BIO 5991, 1 credit hour) is required the semester of graduation. The 42 course hours

2/4/2009
must include at least 18 semester hours of formal classroom courses and, with approval, may include up to 6 credit hours of 4000 level undergraduate courses. The balance of the 42 course hours may be taken as Biological Research (BIO 5995) or Biological Research Rotation (BIO 5998). Courses that are considered "deficiencies" in a student’s prior education cannot be used in fulfilling the requirements for a graduate degree; they should be identified on the program plan as deficiencies and taken above and beyond the requirements.

Summary of course requirements:

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal Course Work Beyond Bachelor's Degree</td>
<td>18-42</td>
</tr>
<tr>
<td>Biological Research or Biological Research Rotation</td>
<td>0-24</td>
</tr>
<tr>
<td>Doctoral Dissertation (maximum)</td>
<td>30</td>
</tr>
<tr>
<td>Biological Research Seminar (semester of graduation)</td>
<td>1</td>
</tr>
<tr>
<td>Biological Sciences Seminar (each semester of attendance)</td>
<td>0</td>
</tr>
</tbody>
</table>

A minimum of 73 credits beyond the bachelor's degree is required.

At least 12 semester credit hours of coursework and all of the research/dissertation credits must be taken at Florida Tech. At least 15 semester credit hours of dissertation must be taken beginning with the term in which the student is admitted to candidacy. Students matriculating with a master's degree may transfer up to 30 hours course credit provided the courses are comparable to core and elective courses. A grade lower than "B" in any transfer graduate course will not be counted toward the 73 hours. Thesis and research courses cannot be transferred toward the Ph.D. degree.

Students who began SU06 or earlier must take 24-48 credits of formal course work for a total of 79 credits. All other credits remain the same.

Program Plan. Students may pursue one of three program plans depending upon their field of interest. Each program plan consists of four parts: (1) Core Curriculum (required of all students in that program); (2) Colloquia and Seminars; (3) Electives; and (4) Research and Dissertation. Students must have the prerequisite for any core course they select; otherwise they must take the prerequisite as a deficiency. Core courses are not deficiencies. A signed and approved program plan must be submitted to the Registrar’s Office no later than 1 mo prior to the time 9 semester credit hours of graduate course work have been completed. See section 2.2.1 of the Graduate Programs Policies and Procedures Manual.

Program Plan for Cell and Molecular Biology (Major Code 9021).

Core Curriculum

Doctoral students may satisfy part or the entire core course requirement by transfer of equivalent graduate courses taken in fulfillment of a Master of Science or similar degree.

BIO 5501 Cell and Molecular Biology (3 credits)

Seminars
BIO 5990 Biological Sciences Seminar (0 credit)
BIO 5991 Biological Research Seminar (1 credit)

Electives

BIO 5080 Mechanisms of Biological Clocks (3 credits)
BIO 5501 Cell and Molecular Biology (3 credits)
BIO 5502 Molecular Biology of Signal Transduction (4 credits)
BIO 5521 Regulation of Animal and Plant Development (3 credits)
BIO 5522 Bioinformatics, Genomics and Proteomics (3 credits)
BIO 5535 Current Topics in Biotechnology (3 credits)
BIO 5545 Growth and Division of Cells: Prokaryotes (3 credits)
BIO 5546 Growth and Division of Cells: Eukaryotes (3 credits)
BIO 5570 DNA Structure and Function (3 credits)
BIO 5575 Biology of Cancer (3 credits)
BIO 5576 Molecular Genetics (3 credits)
BIO 5585 Protein Structure and Function (3 credits)
BIO 5600 Advanced Plant Physiology (3 credits)
BIO 5605 Plant Cell Studies (3 credits)
BIO 5725 Pathogenic Bacteriology (3 credits)
BIO 5815 Molecular Studies of Marine Biodiversity (3 credits)

(See also electives and core curriculum for Marine Biology and Ecology and Conservation Biology programs for additional choices)

Research and Dissertation

BIO 5995 Biological Research (3 credits)
BIO 5998 Biological Research Rotation (3 credits)
BIO 6999 Dissertation in Biological Sciences (3 credits)

Program Plan for Marine Biology (Major Code 9021).

Core Curriculum

Doctoral students may satisfy part or the entire core course requirement by transfer of equivalent graduate courses taken in fulfillment of a Master of Science or similar degree.

BIO 5028 Design and Analysis of Ecological Studies (4 credits) and
BIO 5075 Multivariate Analysis in Biology (3 credits)

Seminars

BIO 5990 Biological Sciences Seminar (0 credit)
BIO 5991 Biological Research Seminar (1 credit)

Electives

BIO 4515 Ecology of Coral Reefs (3 credits)
BIO 4517 An Introduction to Modeling for Ecology and Biology (4 credits)
BIO 5005 Comparative Biology of Invertebrates (3 credits)
BIO 5010 Ichthyology (4 credits)
BIO 5022 Coral Reef Ecology (3 credits)
BIO 5025 Ecology of Salt Marsh and Mangrove (3 credits)
BIO 5036 Explorations of Animal Behavior (3 credits)
BIO 5037 Navigation and Orientation of Marine Animals (3 credits)
BIO 5040 Marine Mammalogy (4 credits)
BIO 5042 Feeding Ecology of Fishes (3 credits)
BIO 5047 Ecological Physiology of Fishes (3 credits)
BIO 5055 Echinoderm Biology (4 credits)
BIO 5060 Biology and Ecology of Seagrasses (3 credits)
BIO 5065 Natural History of the Indian River Lagoon (4 credits)
BIO 5085 Biological Imaging (3 credits)
BIO 5090 Natural History and Management of the Upper St. Johns River (3 credits)
BIO 5120 Ecology of Tropical Marine Communities (3 credits)
BIO 5140 Coral Ecology (3 credits)
BIO 5140 Coral Ecology (3 credits)
BIO 5510 Current Topics in Ecology (3 credits)
BIO 5630 Sensory Biology (3 credits)
BIO 5813 The Biology of Sea Turtles (3 credits)
ENS 5800 Limnology 1 (3 credits)
ENS 5801 Limnology 2 (3 credits)
OCN 5102 Marine Phytoplankton (3 credits)
OCN 5103 Marine Zooplankton (3 credits)
OCN 5104 Marine Benthos (3 credits)

(See also electives and core curriculum of Cell and Molecular Program and Ecology and Conservation Biology Programs for additional choices)

Research and Dissertation

BIO 5995 Biological Research (3 credits)
BIO 5998 Biological Research Rotation (3 credits)
BIO 6999 Dissertation in Biological Sciences (3 credits)


Core Curriculum

Doctoral students may satisfy part or the entire core course requirement by transfer of equivalent graduate courses taken in fulfillment of a Master of Science or similar degree.

BIO 5028 Design and Analysis of Ecological Studies (4 credits) and
BIO 5075 Multivariate Analysis in Biology (3 credits)

Seminars

BIO 5990 Biological Sciences Seminar (0 credit)
BIO 5991 Biological Research Seminar (1 credit)
Electives

BIO 4515 Ecology of Coral Reefs (3 credits)
BIO 4517 An Introduction to Modeling for Ecology and Biology (4 credits)
BIO 5017 Tropical Plant Community Ecology (3 credits)
BIO 5020 Field Ecology 1 (3 credits)
BIO 5021 Field Ecology 2 (3 credits)
BIO 5023 Field Ecology 3 (3 credits)
BIO 5024 Field Ecology 4 (3 credits)
BIO 5025 Ecology of Salt Marsh and Mangrove (3 credits)
BIO 5033 Paleoecology (4 credits)
BIO 5040 Marine Mammalogy (4 credits)
BIO 5060 Biology and Ecology of Seagrasses (3 credits)
BIO 5065 Natural History of the Indian River Lagoon (4 credits)
BIO 5070 Physiological Ecology (3 credits)
BIO 5090 Natural History and Management of the Upper St Johns River (3 credits)
BIO 5120 Ecology of Tropical Marine Communities (3 credits)
BIO 5140 Coral Ecology (3 credits)
BIO 5420 Pre-Columbian Ecosystems (1 credit)
BIO 5421 Neotropical Archeoecology (3 credits)
BIO 5510 Current Topics in Ecology (3 credits)
ENS 4010 Geographical Information Systems (3 credits)
ENS 5001 Global Environmental Problems and Solutions (3 credits)
ENS 5701 Environmental Regulation and Impact Assessment (3 credits)
OCN 5204 Marine Pollution (3 credits)
OCN 5801 Coastal Systems Planning (3 credits)
OCN 5803 Legal-Environmental Relationships (3 credits)

(See also electives and core curriculum of Cell and Molecular Program and Marine Biology Program for additional choices)

Research and Dissertation

BIO 5995 Biological Research (3 credits)
BIO 5998 Biological Research Rotation (3 credits)
BIO 6999 Dissertation in Biological Sciences (3 credits)

**Dissertation Committee.** The committee consists of 5 graduate faculty. Four must be from Biological Sciences and three of the four must be full time faculty on the Melbourne campus. Only one Associated Graduate Faculty (adjunct) is permitted to serve on any committee in either the advisor role or as one of the four Biological Sciences members. The fifth member of the committee is the outside member.

The outside member is a full-time faculty member in an academic department at Florida Tech that is not Biological Sciences. The outside member cannot hold adjunct status and they cannot be affiliated in any official way with Biological Sciences. The role of the outside member is as follows: 1) to serve as a representative of the university to ensure that the rules of the university are followed, 2) to serve as an advocate for the student regarding committee proceedings, 3) to provide an additional level of research expertise and perspective from outside the area of Biological Sciences.

2/4/2009
If desired, additional committee members are permitted to serve on a graduate committee based on their appropriate research expertise and willingness to assist the student. Additional members may be solicited from any academic or industrial institution as is deemed appropriate by the student in consultation with his/her advisor. Additional members are not permitted to vote, but are invited to attend all meetings concerning the student’s advancement, although their attendance is not required.

Committee members are selected in consultation with the dissertation advisor and with approval of GASP. The dissertation advisor chairs the committee. The dissertation committee has the responsibility for general supervision of the student’s research and ultimately of certifying to the graduate dean that an acceptable dissertation has been submitted and that all degree requirements are completed. Although the dissertation advisor provides day-to-day guidance to the student, all members of the committee are available for consultation, and the student should feel free to ask for advice. The dissertation committee also has general responsibility for monitoring the student's progress.

Changes in Committee. After the student has been advanced to candidacy (passed the comprehensive examination and submitted an approved research proposal) changes in the composition of the Doctoral Committee will be permitted only under unusual circumstances. If personal or professional considerations suggest that such action would be in the best interest of the student, committee members or the university, any Committee member (including the Major Advisor) may voluntarily withdraw from the Committee by notifying the Major advisor, the Department head and the Dean of the College of Science in writing. The student will not be permitted to register for more than one additional semester following withdrawal of a Committee member unless a full Committee is re-established. To re-establish the Committee, the Major Advisor nominates the new Committee member and submits their name, in writing, to the GASP committee for approval.

The replacement of a member of the Doctoral Committee for any reason other than voluntary withdrawal will be permitted only after review and approval of a written request of such actions by the GASP committee. Such requests must originate from the Department Head.

Comprehensive Examination. The purpose of the comprehensive examination is two-fold:

- To determine if the student’s acquired knowledge in biology is consistent with an individual holding a doctoral degree in the biological sciences
- To evaluate the preparedness of the student to plan and conduct dissertation research successfully

The comprehensive exam will be offered each fall and spring semester. Doctoral students must attempt the exam within a window opening in their 3rd semester and closing at the end of their 5th semester. If a student has not successfully passed the exam by the end of their 5th semester, that student will be required to leave the program.

Request to Take Comprehensive Examination. The request to take the comprehensive examination is made in writing (see form, p. 79) to the GASP committee during the first week of the semester that the exam is administered. The student, dissertation advisor and the committee
must sign this request. The student, with the advice and guidance of the advisor and dissertation committee, chooses four areas in which the examination questions will be given and indicates the subject areas to the GASP committee. Student must be in good academic standing and have completed more than 80% of all formal coursework in the program plan at the time of request.

**Ad Hoc Committees.** An ad hoc examining committee will design and give the comprehensive exam. The ad hoc committee includes the student’s doctoral committee in addition to faculty members from the student’s division (all faculty in the division are encouraged to participate). All participating faculty may suggest questions for the comprehensive exam, however, an attempt will be made to test students in areas recommended to the ad hoc committee by the faculty who serve on the students doctoral committee. Each student will be required to successfully answer 2 questions in each of 4 areas of study. The number of questions offered for each category on the exam will be determined by the number of students taking the exam. Each question will be graded by two members of the ad hoc committee. The committee, prior to the meeting, selects a committee chair for each ad hoc committee. The responsibilities of the ad hoc committee chairs are to:

- Remind the committee of the confidential nature of the entire comprehensive examination process and that under no circumstances should any of its proceedings be discussed with the students
- Inform committee members of the subject areas chosen by the students and solicit questions for the comprehensive exam in the respective subject areas
- Compile submitted questions and prepare them for review by the committee members at the ad hoc committee meeting
- Lead the review and editing process conducted by the members of the committee to insure that the written questions are appropriate as comprehensive examination questions and suitable for all students taking the exam
- Solicit participation of the dissertation committee during the question editing process to insure that the examination questions are, indeed, appropriate
- Submit approved questions to the Administrator for review and compilation of the four-part Comprehensive Examination and for submission to the GASP for approval

**Administration of the Examination.** The Associate Department Head in charge of Graduate Programs is the Administrator of the examination. The responsibility of the Administrator will be to:

- Schedule and proctor the exam during the 10th week of the semester
- Collect and return the answers to the appropriate faculty for grading
- Collect the graded exams from the faculty and ensure that a written evaluation accompanies the graded exam
- File an exam report with the Department Head
- Notify the student and advisor, in a timely fashion and in writing of the results of the examination

**Examination Structure.** The examination will be written, closed book, and not a take-home exam. It consists of four subject areas chosen by the student and the dissertation advisor. Each subject area will be represented by three questions, two of which must be answered by the student. Each subject area consists of essay questions, and the student may take up to 4 h to complete a subject area. A schedule for the subject area exams will be published in advance of
the examination week. Each subject area exam will be given once during the examination week, and the Administrator will proctor it.

**Exam Evaluation.** After the examination, the Administrator returns the answers to the faculty members who were the primary contributors to the questions for grading. It is customary for two ad hoc members to grade each question. If a grader has questions about a particular answer or if the answer is a borderline pass/fail, the grader may request an oral interview with the student before a final evaluation of the answer is made. An oral interview is not available if the decision to pass or fail has already been made. Students must pass both questions to pass a subject area and all 4 subject areas to pass the comprehensive exam. The graded examination and the graders' written evaluations become part of the student’s permanent departmental record. Students may request to see the written comments of the graders but may not review the graded examination.

**Examination Re-Test.** Students who fail one or more subject areas are classified as “failed”. Students who pass at least two subject areas are permitted to re-test in those subject areas that they failed. Students who fail three or four subject areas are dismissed from the program. Every effort is made to remediate the student who qualifies for re-testing. The dissertation committee assumes the responsibility for the remediation process and may require formal coursework, written literature reviews, and/or self-study in those subject areas failed. The dissertation committee is assisted in the remediation plan by reviewing the graders' written evaluations and recommendations. A written justification for the remediation strategy must be submitted to the GASP for approval prior to scheduling the re-test. The re-test is scheduled once a year and will be administered to all students requiring the re-test at one time.

**Re-Test Format.** Every effort must be made and every opportunity afforded to students requiring a re-test to insure that no one is inadvertently discriminated against and that a successful re-test is accomplished. After successful completion of the remediation program, students must apply to the Administrator for a re-test. The Administrator schedules the re-test after hearing from all students requiring a re-test. Any student who is not available or is not ready to take the regularly scheduled re-test must wait until the next examination cycle in the fall semester. The format of the re-test is identical to the original examination including the possibility of a follow-up oral interview if requested by the graders.

**Dissertation Proposal.** After the comprehensive examination is passed, the student presents a dissertation research proposal to the dissertation advisor and dissertation committee. The proposal should follow the format on p. 21. When the proposal is complete, the student schedules a proposal defense with the dissertation committee at least 2 wk later.

The proposal defense is a broad research oriented oral exam that emphasizes the proposed dissertation research and related issues. The dissertation committee's responsibility is to evaluate the intellectual preparedness of the student for admission to candidacy, the scientific merit of the proposed research, and to insure that appropriate facilities, expertise and resources are available to successfully conduct the research. A timetable of milestones is also discussed. When the oral exam is successfully completed and the dissertation committee has approved the dissertation, the dissertation advisor will attach a signed Progress Form III. (Thesis/Dissertation Title and Proposal Approval) (see Appendix) to the proposal as its approval page and forward the proposal to the GASP for inclusion in the student's file.
Foreign Language Requirement. The Department of Biological Sciences does not require evidence of foreign language competence but strongly urges candidates to acquire reading ability in at least one language other than English.

Admission to Candidacy for the Ph.D. As soon as the comprehensive examination is passed and the dissertation proposal is approved, the student can apply for admission to candidacy. The advisor must Complete Progress Form "IV. Admission to Candidacy" and send it to the GSC for approval. A cumulative GPA of 3.2 is required for admission to candidacy.

After admission to candidacy, students must register for BIO 6999 - Dissertation in Biological Sciences (3 credits). Continuous enrollment in at least 6, 9, or 12 credits of dissertation each semester, including summer, is required until graduation.

Dissertation Research. The doctoral research should represent a significant contribution to our knowledge of biology and should be of such quality that it will be acceptable for publication in a national or international journal. During the period of dissertation research, the student should meet with the dissertation advisor to discuss dissertation progress.

Progress Toward the Degree. All students are expected to make reasonable progress toward the degree. Once a student has been admitted to candidacy, he (she) has 5 yr in which to complete the research and defend the dissertation and graduate. If the degree is not completed within the 5 years, the comprehensive examination must be re-administered. The new exam will reflect developments of importance in the area of study occurring since the first examination as well as areas of general importance. As research begins in earnest, a progress report is required each semester, describing methodologies used, data collected, problems encountered, and plans for the following semester. The report is distributed to the dissertation advisor and to each member of the dissertation committee for review. Any member of the committee may request a meeting with the student for purpose of further discussing the report. A copy of the graded report ("S" or "U") is forwarded to the GASP and becomes part of the student's file. This evaluation process must be completed and the report forwarded to the GASP by the Friday of finals week.

If satisfactory progress has not been made (a grade of "U"), results of the review by the dissertation committee will be presented, with the recommendations, to the GASP. The GASP will decide what actions, if any, are required.

Preparation of Dissertation. The dissertation should be an excellent piece of scientific writing. The writing should be clear and grammatically correct. Methods, results, and conclusions must be described thoroughly. The format of the dissertation must follow the set of instructions for preparing thesis or dissertation that is included in this handbook. The dissertation advisor should distribute copies of the dissertation to the dissertation committee only after approval. The dissertation should be submitted to the committee a minimum of 4 wk prior to the anticipated date of the final exam.

Final Examination. A completed Progress Form V "Approval for Thesis/Dissertation Presentation and Final Exam" form (see Appendix), containing the required signatures, needs to be forwarded to the GASP for approval before the final exam can be scheduled. The request is
submitted to the Graduate Programs Office at least 2 wk prior to the exam, following procedures specified by the Graduate Programs Office.

The final exam for the Doctor of Philosophy degree consists of two parts: a seminar and a final oral exam. The first is a public seminar that is open to all faculty and students. The seminar coordinator posts notices of the seminar for that semester. At the seminar the student presents the research in its entirety and fields any questions and comments from the general audience. The second part of the defense, the final oral exam, takes place after the seminar. The student meets privately with the dissertation committee and any graduate faculty who wish to attend. The student answers any questions or suggestions on the research that the faculty may have about the dissertation. Once the dissertation is unanimously approved by the dissertation committee, the dissertation advisor notifies the GASP and the Graduate Programs Office (see doctoral dissertation oral examination report form, Appendix) of the successful completion of the exam and that all degree requirements have been met.

**Recommended Sequence of Events for Completion of Ph.D. Requirements.** The following list summarizes the landmarks of progress that should be followed as closely as possible.

1. Select advisor and be accepted into a laboratory.
2. Arrive at Florida Tech.
3. Meet with advisor for preliminary conference, selection of courses for first semester of study, and completion of Progress Form I.
4. Submit a Program Plan to the GSC for review and approval.
5. Complete the majority of course work.
6. Select dissertation committee, 4 members (1 external), in cooperation with dissertation advisor.
7. Schedule, take, and pass written comprehensive examination administered by the GSC.
9. Complete Progress Form II. Admission to Candidacy, and submit to GSC for approval.
10. Complete classes.
13. Set date for dissertation defense and submit dissertation to committee with advisor's approval.
14. Notify Graduate School of exam date 2 wk in advance.

15. Submit 5 copies of the completed and approved dissertation to the Graduate Programs Office.
INSTRUCTIONS FOR PREPARING A PROPOSAL, THESIS, AND DISSERTATION

INTRODUCTION

The term thesis refers to the written manuscript submitted as a requirement for an M.S. degree at Florida Institute of Technology, and the term dissertation refers to that submitted for a Ph.D. degree. To avoid being cumbersome, the word thesis will be used throughout this guide for both.

The purpose of a graduate thesis in the sciences is to show others in your field that you are now capable of not only conducting original research but also communicating the results effectively to the scientific community. Your thesis will very likely be your first publication in the field, and as such becomes an especially important landmark in your career. A well-prepared thesis makes the resulting journal articles much easier to produce, lends a sense of credibility to the material, and, in general, reflects well on the department and university. Conversely, a thesis with misspellings, poor grammar, technical inconsistencies, and poorly prepared illustrations will make the preparation of any resulting journal article tedious, will make the reader wonder if the attention to scientific detail is equally sloppy, and will reflect poorly on the department and university and particularly the student.

CHOICE OF SUBJECT

Selecting a subject worthy of investigation is one of the most significant aspects of your graduate work. Such a topic should never be chosen without thoughtful consideration on your part and the approval of your graduate advisor.

The thesis must reflect a comprehensive understanding of the pertinent literature (which must be properly cited) and must express clearly and grammatically the method, significance, results, and interpretation of your research. The length of the completed manuscript should be no longer than is necessary to present all pertinent information. This length will, of course, vary widely depending on the research topic, nature of data, and the degree being sought.

The thesis should be a single unit of scholarly narrative, properly supported and documented, reporting your original work done under the supervision of a member of the graduate faculty (the advisor).

PROPOSAL PREPARATION

GENERAL INFORMATION. After preliminary approval by the advisor, one copy of the research proposal must be submitted to each member of your advisory committee. The proposal is a formal description of your projected research. It is designed to offer you an opportunity to demonstrate your ability to pursue the projected topic to a successful conclusion. The nature of the problem to be examined, the status of current research relating to the subject under consideration, the research method, the budget and the importance of the projected work should be carefully described in the proposal. A timeline or milestone chart indicating tasks and when they are to be completed should also be included. See p. 21 for additional information on proposal preparation.
All rules of style and format (such as those pertaining to word processing, references, and footnotes) that apply to the completed thesis also apply to the proposal.

**THESIS PREPARATION**

**STANDARDIZING PAGE AND TEXT FORMATS.** This manual is to be used as a style guide in answering questions regarding the text and page format of theses. The purpose behind these specifications is to achieve a uniform, consistent and professional appearance in all theses produced in the Biological Sciences Department at Florida Tech.

The formatting rules in this guide have been modeled after, and adapted from, two well-known style manuals:


These references should be consulted when questions arise that are not specifically covered by this manual. Use The thesis writer's handbook for page style and format questions concerning the title page, approval page, the abstract, introduction, etc., and text format requirements for spacing, margins, indentations, etc. Use the CBE style manual for style and format questions concerning citing references in the text, list of references, illustrations (figures and tables), the use of units, and proper abbreviations.

Do not use past theses as examples of format and style. Not all theses have followed the rules, and the rules have changed over the years.

**Word Processor Specifications.** Select a 12 pt font with a plain-face type (Times New Roman or Square Serif) rather than script, italic, or some other ornamental style when printing your thesis. If there is doubt about the size or style of type, clarify the matter with the Department Head before preparing the manuscript. The same type style must be used throughout the paper; do not mix type styles; do not use bold face type for headings or legend titles. The font size must also be the same, including page numbers; but superscripts and subscripts may be struck in 10 pt font. Italics may be used for generic and specific names of organisms and anywhere italics are normally used (e.g., genes). The printer must produce letter-quality print, superscripts, and subscripts. A Laser printer must be used. Dot matrix or Inkjet printers are not acceptable. Do not justify the right margin; not all word processors do a good job without leaving very irregular spacing within the text line.

**Paper.** Print your thesis on at least 20-pound white paper (e.g., standard xerographic paper), not on lightweight paper or onionskin, since this will not feed automatically through a photocopier.

**Spacing and Indentions.** The text is double spaced throughout. Headings or the first line of text will begin 2 spaces below the page number. In preliminary pages, the text ends 2 spaces
above the page number. Single spacing (six lines per inch) is used only for specific, appropriate purposes, such as blocked inset quotations, itemized or tabular materials, figure and table legends, and literature cited (single space within the citation, double space between citations). Additional instructions on spacing are given in other sections.

The first sentence of each paragraph should be indented five spaces or 0.5 in indentation. Any quotation of six typed lines or fewer should use the same spacing as the narrative text. Quotations longer than six typed lines should be inset and single-spaced. Inset quotations do not require the use of quotation marks.

Margins. All typing and page numbers must fit within the margins (1.5 inch at the left, and 1.0 inch at the top, bottom, and right). If Microsoft Word is used, the following margin set up is recommend for all pages (including preliminary pages): top, 1.3 inch; bottom, 1.3 inch; left, 1.7 inch; right, 1.2 inch; header (where page number is printed in body), 1.0 inch; footer (where page number is printed in preliminary pages), 1.0 inch; gutter 0 inch. In addition to leaving one or two spaces around the margin to allow for expansion normally associated with the duplication process, this page setup gives the appearance of double spacing between the text and page numbers. All computer data, illustrations, and tables that lend themselves to reproduction on photographic or other acceptable paper must conform to the margins.

Pagination. Every page in the manuscript EXCEPT the title page and the approval page must be numbered. These 2 pages are considered to be pages. i and ii, but no pagination numeral is shown on these 2 pages.

- Preliminary pages--lowercase Roman numerals (iii, iv, v, vi, etc.) are used. The first page on which a number appears is the abstract page, which is numbered iii and is placed right after the approval page.
- Text and supplementary pages--Arabic numerals are used. The first page of the narrative text begins with 1, and the numbering runs consecutively to the end of the manuscript.
- Pages are numbered consecutively, as are tables, figures, and equations. The only exception to this rule is when an appendix has tables, figures, and equations (i.e., Table A-1).

Begin every major division of a thesis on a new page. These major divisions are: Abstract, Dedication (optional), Acknowledgments, Table of Contents, List of Tables, List of Figures; each new section such as Introduction, Materials and Methods, Results, Discussion, Conclusions, Literature Cited, and Appendix.

Subheadings or subdivisions within chapters and sections do not start on a new page but are placed on the page wherever they appear in the development of the text. The only exception is when this produces what is termed an "orphan" (i.e., the last line of the page is the heading itself). In this case, start the heading on the following page.

Placement of Page Numbers. All preliminary page numbers (lowercase Roman numerals) are centered on a line 1.0 in from the bottom edge of the page. All other page numbers (Arabic numerals) are placed on a line, 1.0 in from the top of the page and even with the right-hand margin.
PARTS OF THE MANUSCRIPT. A thesis manuscript ordinarily has three main parts:
(1) the preliminary pages, (2) the text, and (3) the supplementary pages.

Preliminary Pages. Include (listed in the order in which they appear in the thesis):

- Title page
- Approval page
- Abstract
- Acknowledgments (the Dedication page, if any, is placed directly before the
  Acknowledgments page)
- Table of Contents
- List of Tables (if more than one table is used)
- List of Figures (if more than one figure is used)

The Text. Includes (listed in the order in which they appear in the manuscript):

- Introduction
- Body of the thesis with the large divisions (Materials and Methods, Results, Discussion
  and/or Conclusion.)

Supplementary Pages. Include (listed in the order in which they appear in the
manuscript):

- Literature Cited (required in all theses and dissertations)
- Appendices (if needed).

All preliminary page titles, all chapter designations and titles, and supplementary page
titles are centered at the top of the page (two spaces below the page number) and are typed in
capital letters. Section titles (when used in place of chapters) are typed in capital letters and are
centered at the top of the page (two spaces below the page number). Examples of some of the
major parts of the manuscript are presented in Fig. 1-4. Figures are for style, spacing, and format
information only. They are not to be used as page or margin templates. Page setup and margins
are considered in other sections of this guide.

Title Page. The title page must follow exactly the style, spacing, and form of the
example in Fig. 1. Points to note particularly are:

- The title is typed in capital letters, double spaced (if the title is more than one line
  in length) and centered within the margins of the paper in an inverted pyramid
  style.
- There is no page number on the title page (although it is considered to be p. i).
- For the M.S. degree, the term `Thesis' is used instead of `Dissertation'.
- The full legal name of the author, without initials and without designation of
  profession, military rank, or marriage is listed as shown.
- The full name of the degree to be awarded (MASTER OF SCIENCE or DOCTOR
  OF PHILOSOPHY) and the major department (BIOLOGICAL SCIENCES) are
  written out in capital letters.
• Degrees are awarded in May, August, and December. The appropriate month and year must be shown on this page.

Approval Page. The approval page, following exactly the style, spacing, and form of the example shown in Fig. 2, must bear the original signatures of all members of your advisory committee and the Department Head. Care should be taken to assure that they sign in black ink, since other colors do not reproduce well.

The number of members of your advisory committee determines the number of signature spaces on the page. The position (in terms of the committee) of each member of the committee must be indicated under each signature. The committee as listed on this page must include all the names indicated as being committee members on the exam announcement for the defense.

Particular points to note are:
• The title is typed in capital letters, double spaced (if more than one line on length), and centered within the margins of the paper in the inverted pyramid style.
• The line “Approved as to style and content by:” is lined up with the signature line, not centered.
• There is no page number on the approval page (though it is considered to be p. ii).
• For the Ph.D. degree, the word "DISSERTATION" is used instead of "THESIS".
• Your full legal name without initials and without designation of profession, military rank, or marriage is listed as shown.
• If your committee has co-chairpersons, then each is listed by position as "Co-chairperson" of the committee.
• If the Department Head serves also as a member or as chairperson or co-chairperson of your advisory committee, so indicate.
• Degrees are awarded in May, August, and December. The appropriate month and year must be shown at the bottom of the approval page.
TITLE OF DISSERTATION
IN CAPITALS

by

YOUR NAME IN CAPITALS

B.S., State University of New York at Buffalo
M.S., University of Chicago

A dissertation submitted to the Department of Biological Sciences
of Florida Institute of Technology in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY
in
BIOLOGICAL SCIENCES

Melbourne, Florida
May 2001

Figure 1. Title page.
TITLE OF THESIS
IN CAPITALS

A THESIS
by
YOUR NAME IN CAPITALS

Approved as to style and content by:

______________________________
Alan C. Leonard, Ph.D., Chairperson
Professor
Department of Biological Sciences

______________________________
Charles E. Helmstetter, Ph.D., Member
Professor
Department of Biological Sciences

______________________________
Bill J. Baker, Ph.D., Member
Professor
Chemistry Department

______________________________
Gary N. Wells, Ph.D.
Professor and Head
Department of Biological Sciences

May 2000

Figure 2. Thesis committee approval page.
Abstract. Your thesis must contain an abstract placed immediately after the approval page. Six hundred words is the maximum length of the abstract, but nearly all abstracts are shorter than this.

The abstract should contain the following:

- A clear statement of the problem you researched and its significance
- A brief description of the method of investigation
- An explanation of data analysis
- A statement of conclusions and how they relate to the original research problem

A heading following the style of the example in Fig. 3 must appear on the abstract of your thesis. (The example shown is for a doctoral degree in order that it may illustrate the style and spacing for the listing of previous degrees.) Particular points to note are:

- Numbering of pages starts with the abstract page ('iii')
- The word ABSTRACT is centered at the top of the page within the margins and is typed in capital letters
- The title of the thesis is typed in capital letters (and single spaced if more than one line in length) a triple space below the word ABSTRACT
- Your full legal name and your previous degrees are listed a double space beneath the last line designating the title
- Your chairperson is listed a double space below the line designating your previous degrees. NOTE: When there are co-chairpersons on your advisory committee, both are listed on the abstract page
- Example:
  Co-chairpersons of Advisory Committee: Amy L. Wilson, Ph.D.
  Walt T. Smith, Ph.D.

- The text of the abstract starts a triple space beneath the heading with a 5 space (0.5 in) indentation. The abstract text is typed double-spaced and is consistent with the spacing style followed in the text.

Dedication. A dedication (to parents, spouse, etc.) is optional. If included, it should appear before the acknowledgments on a separate page, untitled, single-spaced, with the page number shown as a Roman numeral centered on a line 1.0 in from the bottom.

Acknowledgments. It is important and appropriate that you always acknowledge those people and organizations that provided significant contributions to your research and thesis. Also, be sure to acknowledge any financial support that you received for your project. The acknowledgment page should be a separate page with "ACKNOWLEDGMENTS" centered at the top of the page with the page number shown as a Roman numeral centered on a line 1.0 in from the bottom.

2/4/2009
ABSTRACT

A STUDY OF THE PHILOSOPHY OF RESEARCH FROM THE NINETEENTH CENTURY TO THE PRESENT TIME

by Donald Jay Lee, B.A., Central College;
M.S., Glenn State University

Chairperson of Advisory Committee: Joseph S. Guy, Ph.D.

The text of the Abstract starts on this line with a 1/2 inch (5 spaces) indentation.

Figure 3. Abstract page.
Table of Contents. The table of contents indicates the major divisions and principal (or second-order) subheadings of the manuscript. It should provide an analytical presentation of the materials in the study and page numbers on which the sections start. Preliminary page listings in the table of contents start with the abstract (iii) and must include all preliminary pages (inclusion of the table of contents page itself is optional).

All divisions of the text (i.e., chapters or sections) and subheadings within each chapter or section must be listed in the Table of Contents. The appropriate spacing, indenations, and capitalization should show the subordination of the subheadings. The table of contents at the beginning of this guide can serve as an example.

All supplementary pages (literature cited and appendices, if any) must be listed in the table of contents. The numbering, wording, and pagination of titles and headings must be exactly the same in the table of contents as they are on the pages of the manuscript.

Text. An example of page and text formatting is shown in Fig. 4. The text may be divided into chapters or sections. Chapters are used only when the thesis or dissertation topic consists of two or more distinctly separate subjects that cannot be combined. Each chapter is complete; i.e., each chapter has its own section headings. The literature cited sections, however, may be combined.

Chapters are designated by uppercase Roman numerals used consecutively throughout the narrative. Each chapter begins on a new page. The chapter designation (e.g., CHAPTER I) in capitals should be centered within the margins at the top of the page. The chapter title also is in capitals and is centered a double space below the chapter designation. All chapter titles of more than one line in length should be single-spaced. The section heading INTRODUCTION is centered on the margins, 3 spaces below the chapter title and the text begins 3 spaces below the section heading. In addition to an introduction, each chapter may include methods and materials, results, and discussion sections, each beginning on a new page. After all the chapters have been presented, a CONCLUSIONS section should begin on a new page with the heading centered and in capitals. Following conclusions, the LITERATURE CITED section should begin on a new page with the heading centered and in capitals. Each chapter or each section begins on a new page. Subdivisions within these sections or chapters do not begin on a new page. Use a system of subdivisions within the sections or chapters as in the example in Fig. 4.

If the chapter format is selected for the thesis or dissertation, it is suggested that the Department Head be consulted early in the planning for this format.
SECTION HEADINGS
ARE IN ALL CAPITAL LETTERS, AND CENTERED

Theses are generally organized into sections with each section covering a portion of
the thesis topic. Examples may be the headings of the preliminary pages (e.g.
ABSTRACT, ACKNOWLEDGMENTS, TABLE OF CONTENTS, LIST OF FIGURES,
LIST OF TABLES) or, as in the main body of the thesis, the INTRODUCTION,
MATERIALS AND METHODS, RESULTS, DISCUSSION, CONCLUSIONS, and
LITERATURE CITED. If the section heading is more than one line, the lines can be of
different length and single spaced.

Theses may also be organized into chapters if the topic is sufficiently diverse to
warrant it. If this organization is used, the chapter number heading is capitalized and
placed as shown above with the section heading 2 spaces below the chapter number
heading. Chapters are numbered in roman numerals. Each chapter will have its own
introduction, materials and methods, results, discussion, and conclusions sections. A
common literature cited section however should be used.

The main body of the thesis is double spaced, and begins three spaces below the
section heading.

SECOND-ORDER HEADINGS

Second-order headings are typed in capital letters, flush with the left margin, and on
a separate line. The text begins 2 spaces below second-order headings.

THIRD-ORDER HEADINGS. This heading is typed in capital letters, underlined,
indented, and in line with the text.

Fourth-Order Headings. This heading is typed in capital and lower-case letters,
underlined, indented, and in line with the text.

Figure 4. Text page illustrating section headings.
Tables and Figures. Tables and figures must be able to stand alone without benefit of the text. The titles, legends, and symbols must be sufficiently complete so that a reader can understand and interpret the data without the need to refer to the text for explanation. No part of a table or figure can encroach into a margin, including captions, labels, etc. Tables and figures should be placed as close as possible after the first reference made to them in the text. For a short table or small figure, this may be on the text page itself, in which case it should be separated from the text by triple spacing at the top and bottom. A full-page table or figure should be placed on the page following the first reference to it. Subsequent references in later sections to a given table or figure should include the page number in parentheses--e.g. "... as in Fig. 3 (p. 3)."

Each table or figure in the main body of the thesis must have a number and a title. Titles should appear at the top of tables (Table 1) and at the bottom of figures (Fig. 5) leaving 2 spaces between the illustration and the title. Titles should be preceded by the word "Table", or "Figure", followed by an Arabic number and a period. The first word of the title is capitalized, and the title ends with a period. Titles of more than one line are typed single-spaced with a hanging indent, the second and subsequent lines aligned with the first letter of the title. The numbering should be consecutive from the beginning through to the end of the thesis. In this regard, you have two basic choices of format: (1) number the tables or figures consecutively (i.e., Table 1, Table 2, Table 3, etc.) throughout the entire document (except for the appendix); or (2) use a dual number system in which tables are numbered consecutively within each chapter and in which each number is preceded by the chapter number (i.e., Table I.1, Table I.2, Table I.3, etc. in Chapter I, and then Table II.1, Table II.2, Table II.3, etc. for Chapter II). Any references to figures or tables from previous chapters should include both the complete designation and page number (e.g., Table II.2, p. 47). When there are tables and figures in the appendix, they should be numbered Table A-1, Table A-2, etc. in Appendix A and Table B-1, Table B-2, etc. in Appendix B. When tables or figures in the Appendix are referenced in the text, the page number, in parenthesis, must accompany the reference--e.g., “...as in Table B-2 (p. 276).”

All titles and page numbers must be in the same typeface as the body of the text and be full-size regardless of any reduction made of the original illustration image.

Titles should be as concise as possible, but they should clearly describe the content of the table or figure. If two or more titles would otherwise be identically worded, then you must incorporate some differentiating word or phrase into each.

If tables (or illustrations) must be placed sideways on the page (landscape orientation), then the top of the table (or illustration) should be at the binding side of the paper. Tables too long or too wide for a single page, landscape or portrait, may be continued on the following right-hand pages(s). The table title should not be repeated. The heading should read “Table 4. Continued” and column and row headings must be repeated for continued tables.

Tables too long to conform to minimum margins may be typed in a smaller font. The page number, table number, and title should be in the same font size as the text of the document.
Table 1. Caloric density for major prey types of *Dasyatis sabina*. Data expressed as mean ± standard error. Number of species analyzed per taxon or ophiuroid disks from April, August, and December samples indicated in parentheses. The number of subsamples per species was 10. Ash free dry weight (AFDW).

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Caloric Density (cal/mg AFDW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphipods</td>
<td>5.03 ± 0.31</td>
</tr>
<tr>
<td>Isopods</td>
<td>4.78 ± 0.07</td>
</tr>
<tr>
<td>Ophiuroid Disks (3)</td>
<td>5.31 ± 0.42</td>
</tr>
<tr>
<td>Mysids (1)</td>
<td>5.98</td>
</tr>
<tr>
<td>Polychaetes (5)</td>
<td>5.72 ± 0.46</td>
</tr>
<tr>
<td>Bivalve Bodies (2)</td>
<td>5.59 ± 0.17</td>
</tr>
<tr>
<td>Species (17)</td>
<td>5.40 ± 0.41</td>
</tr>
</tbody>
</table>

From Bradley (1996)

Figure 5. Percentage of stingrays engaged in the three activities: feeding, swimming, and resting within the three subhabitats: sand, seagrass, and interface. Data expressed as percent total stingrays observed (dark bars) and percent total stingrays expected (hatched bars). From Bradley (1996).
List of Tables and List of Figures. The titles of all tables and figures must be single spaced and transcribed exactly (with their numbers) and in order on the list of tables and list of figures, respectively. When a title is exceptionally long, you may transcribe the first 2 lines in the list of tables or figures providing that the 2 lines clearly indicate the content of the table or figure and adequately differentiate between that title and those of other tables or figures. Do not include the figure or table legend in the list of tables or figures. Double space between each table and figure listed.

A list of figures or list of tables page is not necessary when the paper contains only 1 table or figure.

Preparation of Figures. Care and some forethought should be given to preparing the illustrations for your thesis. All graphs, charts, and maps should be printed on a high quality laser or ink jet printer. Color may be used if interpretation of the illustration is enhanced by its use. Otherwise, print all illustrations in black ink with appropriate legends to identify or label component parts. To make your figures as effective as possible, try to refrain from packing too much information into one graph. Usually only about nine symbols for different curves can be distinguished (Xs and open and closed circles, squares, triangles, and inverted triangles) on one graph.

If a figure is too large to fit within the margins, it may be photographically reduced. Be wary of using a copier to make successive reductions of a draft graph from which to draw a final figure. Each time a graph is copied, it becomes progressively distorted until the axes are at anything but a 90° angle!

Mounting Figures in the Manuscript. Care must be taken when mounting photographs for inclusion in the manuscript to ensure that they are securely and permanently fastened. Do not use rubber cement or glue sticks. Positional mounting adhesive (Scotch Brand 568 or Scotch 3M Spray Mount Adhesive) is best for this purpose and should be applied to the edges and corners of the photographs to ensure that they are firmly glued to the paper. Be careful: excess adhesive may bleed through the paper and cause pages to stick together. A hot mount method employing a warm iron and dry mount tissue sold by Kodak may also be used, but care must be taken not to damage the photograph with heat from the iron. All materials must observe the margins restrictions.

Photographs printed on glossy printer paper (8½ x 11), designed for that use, may be included in the text. For quality reproduction of half tones, fast drying HP Premium Photo paper such as HP LaserJet Paper HPJ1124 24 lb, 96 brightness is recommended.

Oversized materials, such as large maps or charts that cannot be reduced in size and yet must be included in the thesis must be folded to measure no more than 7½ x 10 inches.

NOTE: Folding of materials to be bound with the pages of a narrative or separate inserts in pockets on the pages is discouraged. Many such items can be reduced and photographically reproduced. In the binding process, inserts are easily misplaced, and folded edges must be very narrow to prevent their being cut in the trimming at the bindery. Reduced tables, charts, and figures must be large enough to read easily.
Ideally, figure legends should be single spaced on the same page as the figures; however, a "facing page" may be necessary. Only a page number appears on the front side of the sheet. The legend is to be typed on the backside of the page, observing the proper margins (binding side of page 1.5 in) and orientation. Legend orientation must agree with the orientation (portrait or landscape) of the figure. The page on which the figure appears is numbered consecutively, with the page number placed in its usual position. On the List of Figures page, the number of the page on which the figure appears is the page number that is to be recorded opposite the figure number and title.

Do not use the "facing page" legend style unless it is absolutely necessary to do so. It is an accommodation only for those situations in which the legend cannot be typed directly onto the page on which the picture or drawing appears or when there is no room on the figure page for the legend to be typed within the margins. These are the only instances when typing is permitted on the backside of a page in a thesis.

Citing References in the Text. No reference should be included in the thesis unless it can be verified against the original document. Practices for citing references in the text vary widely from journal to journal. The system adopted by this manual is the Name and Year system (N-Y) sometimes known as the Harvard System. This system requires you to cite the name(s) of the author(s) and the year of the publication in the text. The placement of the parentheses depends on the sentence structure.

One Author: Clark (1992) or (Clark 1992)
Two Authors: Clark and Jensen (1982), (1984) or (Clark and Jensen 1982, 1984)
Three or more Authors: Clark et al. (1990) or (Clark et al. 1990)

If the author(s) and the year are identical for more than one reference, insert lowercase letters in alphabetical succession after the year.
Clark (1992a) or (Clark 1992a)
Clark (1992b) or (Clark 1992b)

If two or more citations are used to document a single observation, separate them by a comma.
(Clark and Jensen 1982, Clark et al. 1990)

Taxonomic authorship is not a citation of literature. In such cases, follow the rules for punctuation in botanical and zoological nomenclature. For example, in the sentence, The apple snail Ampullaria pinei Dall, 1898 was originally described from the Homosassa River, but Pomacea paludosa Say, 1829 was described from the St. Johns River. Neither Dall nor Say is included in the literature cited section.

Literature Cited. The system of referencing the sources of information used in the thesis must follow the N-Y (name, year) style shown in the CBE Style Manual. Bibliographical entries should include only those sources of materials cited directly in the text of the thesis. The references should appear in a list at the end of the document entitled LITERATURE CITED. References to articles accepted for publication but not yet published and to unpublished documents held in a library or archival collection accessible to the public may also be listed in this section. Other unpublished material or personal communications not accessible to the scientific public are identified in statements within the text.
Information for a bibliographic reference should be taken from the original of the work being cited. Examples listed below for standard journal articles, books and monographs, technical reports, conference proceedings and theses and dissertation, should be followed. Please refer to the CBE Style Manual for other examples not given.

Standard Journal Article:


Chapter in a Book:


Textbook:


Journals and books published before 1920 often printed plates and figures at the end of the volume rather than include them within the article. It is appropriate then to include the figures and plate numbers that go with the article or chapter cited immediately following the page number(s).


Conference Proceedings:

Technical Report:


Dissertation or Thesis:


Abstract:


(Please note that the 4 space-hanging indent is the ONLY exception to the style given in the CBE style manual. Follow all other formatting rules as it applies to the literature cited.)

In the list of literature cited, the entries are arranged alphabetically by author and then chronologically when authors of two or more entries are the same.

If you wish to list general references consulted and used as background study, then these may be listed as a subdivision to the literature cited section. Some subheading title such as "Supplemental Sources Consulted" should be added at the conclusion of the sources cited directly, and the background materials may be listed alphabetically by author and should include the pertinent information for proper documentation.

**Appendix.** An appendix is optional and should be included only after consultation with your thesis advisor and careful consideration of its contribution to the thesis. Figures and tables discussed in the text cannot be placed in the appendices. Materials are included in an appendix that enhance or clarify the narrative text of the thesis. This may include, but is not limited to, technical notes, maps, photographs, computer printouts, complex charts or graphs, and long and detailed methods or survey forms. Use a separate appendix for each different type of material.

A small collection of material can be grouped together and simply titled "APPENDIX." If the amount of material is extensive, it should be classified into categories with each grouping constituting a separate appendix. When more than one appendix is used, each must be designated...
by a letter (Appendix A, Appendix B, etc.), as well as by a title. Each appendix should begin
with a title page in the same format as the first page of a chapter or main section. When no
explanatory text is required, the page will contain only the appendix designation (e.g.,
APPENDIX B) centered between the margins and the title, centered and begun three spaces
below the appendix designation. If the title is more than one line, it is single-spaced. The
sequence of page numbers in the main text is continued in the appendices.

Tables and figures in appendices are numbered consistent with the appendix designation
(Figure A-1, Figure A-2 for figures in appendix A; Table B-1, Table B-2 for tables in appendix
B.)

EDITING YOUR MANUSCRIPT. At the risk of overstating the obvious, if you are at
all unsure of the spelling of a word, USE A DICTIONARY or a spelling checker on a
computer/word processor. Also, be careful to use words correctly. An excellent source book in
this regard is:


In editing your manuscript, you should check especially that your spelling is consistent
(standard American) in all words that have alternative spellings; in geographical, trade, and
people's names; in abbreviations; and in units. The same holds true with regard to spacing.

In proofreading your thesis, many mistakes may be caught if, after reading it front to
back, you read your thesis from back to front. Too often the tendency is to read what should be
there rather than what is there.

References. References require careful, albeit tedious, checking. Some aspects to check in
particular are:

- The dates should agree with those given in the text.
- The spelling and order of names (when there is more than one author) should agree
  with those cited in the text.
- When more than one reference is cited, the order of citations should be done
  consistently.
- The references in the Literature Cited section should be in a consistent alphabetical
  style.
- The reference must include the full title and beginning and ending pages.
- Check that all references are both cited in the text and are represented in the
  Literature Cited section.

Figures. Figures also should be standardized. Some aspects to check in particular are:

- Similar figures should be set up in the same format, especially with regard to axis
  labels, capitalization, and symbols.
- Maps must have latitude and longitude indications or, if the area under
  consideration is small (less than a few square kilometers), they should have a north
  arrow and a scale.
- All symbols should be defined.
- Any accessory scales should be clear as to what they mean.
Table of Contents, Figure Legends, and Tables. Again, consistency is of key importance. Some aspects to check in particular are:

- All headings, table titles, and figure legends should correspond exactly to those indicated in the Table of Contents, List of Figures, and List of Tables (exceptions: if symbols are defined or if a scale is given in a figure legend, they need not be included in the List of Figures).
- A table or figure number cited in the text should correspond to the correct table or figure.
- All tables should have the same format as far as capitalization, both in the table titles and table bodies.
- All footnotes in tables and references in both tables and figures should be formatted consistently. For example, if one table references T. Doe as "Doe (1984)". then all tables use the same format, as opposed to "Doe, 1984" or "Source: Doe (1984)".

Acronyms and Abbreviations. All acronyms and abbreviations (except for standard units) should be defined the first time that they are used in the Abstract and then again the first time that they are used in the text.

Units. Units should be displayed in a consistent manner (only one system is used, e.g., mg/l and mm/h or mg l\(^{-1}\) and mm h\(^{-1}\), not mg/l and mm h\(^{-1}\)). If metric units are used, then all measurements should be metric, unless special custom dictates otherwise. This applies to all parts of the thesis--text, tables, and figures.

Statistics. Consideration of accuracy and precision in measured or calculated values is most important. Without such information, your results will have limited application. Be sure that you use the appropriate number of significant figures consistently. Likewise, you should always include the number of replicates, means, and standard deviations, if applicable.

The use of advanced statistics has enabled scientists to uncover a wide range of correlations and to test for significance. Each statistical test cited in your thesis should be fully referenced and conform to standard nomenclature and procedure.

There are many textbooks and reference books available providing discussions of error and uncertainty in the measurement of properties. An excellent source is Biometry by Sokal and Rohlf.

Numbers in Text. (From CBE Style Manual, 6\(^{th}\) ed.) When a number designates anything that can be counted or measured, Arabic numerals should be used instead of words:

3 toads 5 enzymes 52 proteins 573 clams

Ordinal numbers are treated in the same manner:

2\(^{nd}\) 5\(^{th}\) 47\(^{th}\) 643\(^{rd}\)

If a number begins a sentence, the number should be spelled out or the sentence needs to be reworded:

"Twenty milligrams is the desired amount, but 15 mg is enough."
"The desired amount is 20 mg, but 15 mg is enough."
For numbers consisting of 2 to 4 digits, the numerals are run together:

12 234 2000 3456

For numbers with more than 4 digits, mark off groups of 3 digits, starting at the decimal point with commas. Exceptions are US postal codes, patent numbers, and telephone numbers:

1,234,567 23,456.78

For numbers smaller than 1.0, an initial 0 should always be used before the decimal point:

0.123  P = 0.05

SUGGESTED STYLE MANUALS. No one should assume that this handbook answers the many questions of style arising during the course of preparing a thesis or dissertation. Excellent manuals are available for this purpose. Two manuals are recommended for use in addition to this handbook:


When inconsistencies arise between the manuals that are not resolved by this handbook, the final authority is the Department Head. See the Department Head for any questions you may have.

SPECIFIC ITEMS CHECKED BY THE ADVISORY COMMITTEE

In addition to technical content and quality, the advisory committee will check:

- General neatness, including quality and method of duplication.
- Consistency of style and form.
- Title page, approval page, and abstract page, including:
  
  Style, spacing, and form (follow examples given in this guide).

  Correct month (May, August, or December) and year of graduation on all pages that require this information (title page, approval page, abstract page).

  Your full legal name without designation of profession, military rank, or marriage on title, approval, and abstract pages.

- Exact correspondence of titles and page number of items in the table of contents, list of tables, and list of figures with the same titles and page numbers in the text.

- Style and spacing of major divisions and subheadings within the text, including:

  An examination of each major division. Each major division is typed in capital letters and starts on a new page. Examples of major divisions are the Abstract,
Acknowledgments, Table of Contents, List of Tables, List of Figures, Literature Cited, and each chapter (or section, if used in place of chapter divisions).

Consistent subordination of subheadings within each chapter or section. Subheadings are the divisions within each chapter or section, do not start on new pages, and are not typed solely in capital letters.

Indication of major divisions and principal (or first-order) subheadings on the table of contents page.

- Style and placement of figures and tables within paper.
- Reference system.
- Correct margins.
- Numbering of every page in paper starting with abstract page (‘iii’).

The Department Head will check your thesis very carefully for all of the above items to see that your thesis meets a uniformly high standard of presentation. The Department Head will address not only the scientific content (which is presumed to have been handled by the committee) but also the physical appearance, editorial details, and consistent format and style.

MAKING CHANGES IN YOUR MANUSCRIPT

When your manuscript has been checked for format and style, the Department Head will notify you about changes to be made. Although changes and corrections may be made on the original manuscript (with Liquid Paper or by other similar methods), it is preferable to reprint the corrected page. The corrected pages are then reproduced and substituted for unacceptable pages. You should make all necessary corrections promptly to expedite the final approval for the degree sought.

No interlineations, crossing out of letters or words, corrections made by the use of Liquid Paper, or extensive erasures are permitted on final copies (copies submitted to the Library).

The final typescript must be accurate, consistent in style, acceptable in form, and neat in appearance.

DEADLINES

At least 8 wks prior to anticipated graduation, you should present your thesis to your advisor for review. The thesis must be successfully defended by the Monday of the final week of classes (2 wks prior to commencement) and the completed, signed Examination Report submitted to the Office of Graduate Programs by this time. You must turn the copies of your thesis into the Graduate Office no later than 9:00 a.m. on the Thursday before commencement. All other university or department-wide deadlines are listed in the Graduate Catalog. In addition, you should coordinate closely with your advisor on deadlines that they may require.

2/4/2009
COPYING AND BINDING

The current Thesis/Dissertation Binding Instructions describe the details, costs and deadlines. These are sent to graduate students registered for thesis or dissertation. Students can obtain additional copies at the Graduate Programs Office, Crawford Building. In addition to the copies of your thesis, several other forms must be turned into the Graduate Programs Office. You must bring along your copy of the completed Petition For Graduation form (Appendix p. 87), showing that the binding fee has been paid, or a separate receipt for the paid binding charges (especially if you wish to have more than 5 copies bound).

If you are a Ph.D. candidate, you must also attach a filled-out Survey of Earned Doctorate form (available at the Graduate Programs Office) and, in a separate envelope, a copy of your abstract with a filled-out Dissertation Microfilming Agreement form (also available at the Graduate Programs Office). If you wish to copyright your abstract, you must also enclose the necessary fee in the form of a certified check. Plan to spend at least 15 min in the Graduate Programs Office while all of the paperwork is being completed. You will receive a receipt from the Graduate Programs Office vouching that you have turned in an acceptable thesis because this will be your only proof that you did indeed turn in your thesis, keep it until you receive your bound copy.

When submitting your thesis or dissertation to the Office of the Graduate School, all students must bring the following:

- At least 5 copies of the complete thesis, each in a separate envelope (do not seal or close clasp) labeled with your name, student number, academic department, and a local phone number. Underline your surname and write it in all capital letters as shown below:
  
  SMITH, John Edward
  123-45-6789
  Department of Biological Sciences
  723-1234

- Verification that the binding fee was paid. (first Petition for Graduation, cashier's receipt, canceled check, etc.)

Ph.D. students also bring:

- One additional properly labeled envelope containing a copy of the title page and abstract
- Receipt that the microfilming fee was paid
- Completed Dissertation Microfilming Agreement form
- Completed Survey of Earned Doctorate form

MICROFILMING

If you are a Ph.D. candidate, you must submit your dissertation and an abstract to University Microfilms, Ann Arbor, Michigan, for publication in Dissertation Abstracts International as a requirement for graduation. You must make all of the arrangements and pay all of the costs (as described previously).
PUBLICATION OF MANUSCRIPTS

As a graduate student pursuing work leading to an advanced degree, you are encouraged to publish a part of your thesis in a scholarly journal before you finish your thesis. In addition, you must give an acknowledgment to Florida Institute of Technology. Reprints of these published materials or copies of manuscripts prepared for submission to a journal are not acceptable in that format as part of the final copies of your thesis.
APPENDIX

INTRODUCTION

This appendix includes copies of forms and miscellaneous information required for your use as a graduate student in Biological Sciences. The forms are included to familiarize you with their appearance and are roughly arranged in order of their use as you progress through the graduate program. The copies of the forms cannot be used in place of the actual forms. Most forms are available through the Biological Sciences departmental office.

<table>
<thead>
<tr>
<th>FORMS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>REGISTRATION FORM</td>
<td>61</td>
</tr>
<tr>
<td>CHANGE IN REGISTRATION/STATUS</td>
<td>62</td>
</tr>
<tr>
<td>GRADUATE STUDENT PROGRESS FORMS</td>
<td>64</td>
</tr>
<tr>
<td>I. Preliminary Conference</td>
<td>64</td>
</tr>
<tr>
<td>II. Formation of Thesis or Dissertation Committee</td>
<td>66</td>
</tr>
<tr>
<td>III. Thesis/Dissertation Title and Proposal Approval</td>
<td>68</td>
</tr>
<tr>
<td>IV. Admission to Candidacy</td>
<td>70</td>
</tr>
<tr>
<td>V. Approval for Thesis/Dissertation Presentation and Final Exam</td>
<td>72</td>
</tr>
<tr>
<td>MASTER'S DEGREE PROGRAM PLAN</td>
<td>74</td>
</tr>
<tr>
<td>REQUEST FOR CHANGE IN GRADUATE PROGRAM PLAN</td>
<td>75</td>
</tr>
<tr>
<td>REQUEST TO STUDY AT ANOTHER INSTITUTION AND TRANSFER OF GRADUATE CREDITS</td>
<td>76</td>
</tr>
<tr>
<td>DOCTORAL PROGRAM CHECK LIST</td>
<td>77</td>
</tr>
<tr>
<td>DOCTORAL PROGRAM PLAN</td>
<td>78</td>
</tr>
<tr>
<td>APPLICATION TO TAKE DOCTORAL COMPREHENSIVE EXAMINATION</td>
<td>80</td>
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<td>81</td>
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<tr>
<td>DOCTORAL DISSERTATION PROPOSAL CONFERENCE REPORT AND/OR APPLICATION TO DOCTORAL CANDIDACY</td>
<td>82</td>
</tr>
<tr>
<td>PETITION FOR GRADUATION</td>
<td>83</td>
</tr>
<tr>
<td>NOTICE OF THESIS OR DISSERTATION DEFENSE AND ORAL EXAMINATION</td>
<td>84</td>
</tr>
<tr>
<td>MASTER'S EXAMINATION REPORT</td>
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</tr>
<tr>
<td>DOCTORAL DISSERTATION ORAL EXAMINATION REPORT</td>
<td>86</td>
</tr>
<tr>
<td>GRADUATE STUDENT CHECKOUT FORM</td>
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# REGISTRATION FORM

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<td>(City)</td>
<td>(State)</td>
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<th>Year</th>
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<th>Fall</th>
<th>Spring</th>
<th>Summer A</th>
<th>Summer B</th>
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<tr>
<th>TOTAL HOURS</th>
<th>REQUIRED SIGNATURES:</th>
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<tr>
<td></td>
<td>Student:</td>
</tr>
<tr>
<td></td>
<td>Faculty Advisor:</td>
</tr>
</tbody>
</table>

FOR REGISTRATION CENTER USE ONLY

Florida Institute of Technology • Office of the Registrar
150 West University Boulevard, Melbourne, FL 32901-6988 • (407) 768-8000, ext. 8118
**FLORIDA TECH**

**CHANGE IN REGISTRATION/STATUS**

**A. Student Information**

<table>
<thead>
<tr>
<th>Student ID No.</th>
<th>Major Code</th>
<th>Semester/Year</th>
<th>SEG Site</th>
</tr>
</thead>
</table>

Name (Last/First/Middle Initial.)

Address

(Street/Apt. No.)

(City)

(State)

(ZIP)

(Phone)

(Circle "Yes" or "No" as appropriate.)

1. I receive veterans education benefits
   - Yes
   - No
   Veterans Coordinator/Date

2. I am an international student
   - Yes
   - No
   International Student Affairs/Date

3. I am a student athlete
   - Yes
   - No
   Athletic/Certification Representative/Date

4. This is my first registration at Florida Tech
   - Yes
   - No

**B. Submit completed form, with appropriate signatures, directly to the Registration Center/SEG Site.**

Do not list individual course(s) if you’re dropping all classes or withdrawing from the university. Please check your plans to return or not. Select one option box (1, 2, or 3) below.

1. ☐ I am not currently registered—withdraw me from the university
2. ☐ I plan to return__________ semester
3. ☐ I do not plan to return

<table>
<thead>
<tr>
<th>CRN</th>
<th>Prefix - Course No. - Section</th>
<th>Course Title</th>
<th>Credits</th>
<th>Audit</th>
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*(ANY LINE LISTED ABOVE THAT IS CROSSED OUT MUST BE INITIALED BY ADVISOR.)*

My reason for requesting this change is______________________________

I have attended__________________ week(s) of classes

Student Signature/Date

**C. Faculty Advisor Approval required**

Comment(s)

Faculty Advisor/SEG Site Representative Date

**D. The campus deadlines for dropping and adding course(s) are printed in the university catalog and the schedule of classes. Any deviations to the policy are subject to dean's approval.**

Department Head/Program Chair/SEG Dean/Date

College/School Dean/Date

University Registrar Signature/Date

**E. OFFICE USE ONLY**

Final Grades will be:

- ☐ No Record
- ☐ "W"
- ☐ "NA"
- ☐ Tuition Credit (%)
- ☐ Administrative Fee
- ☐ Drop/Add Fee

Processed by_________________________ Date_________________________

SGASTON: ☐ WS ☐ FR ☐ SFA/SEG M: ESTS Code________________ RSTS________________

Title IV Recipient?: ☐ Yes ☐ No

Financial Aid Init./Date__________________________ Auxiliary Services/Housing Init./Date__________________________

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Florida Institute of Technology • Office of the Registrar

150 West University Boulevard, Melbourne, FL 32901-6975 • (407) 674-8118

2/4/2009
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GRADUATE STUDENT PROGRESS FORM

I. Preliminary Conference

Note: See reverse side for instructions

Student Name: ___________________________ Date: ______________

ID No.: ___________________________ Field of Study: ___________________________

Degree Program: Master’s _ or Ph.D. __________

Advisor: ___________________________

Course Deficiencies: ___________________________

Transfer Credits for Graduate Program:

<table>
<thead>
<tr>
<th>Course Number</th>
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Course Recommendations for First Semester:

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<th>Course Number</th>
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</table>

Total Credit Hours ______

Advisor Signature Date

GASP Approval ___________________________

GASP Committee Signature Date

2/4/2009
INSTRUCTIONS TO THE STUDENT

The academic record and career goals of all incoming graduate students are reviewed at a preliminary conference with their advisor. Any course deficiencies or graduate transfer credits are established and the student is assisted in the selection of courses for the first semester. Use the courses listed on this form as a guide to complete the University’s class REGISTRATION FORM.

After registration submit this completed form to the Biology office for placement in your graduate folder.
GRADUATE STUDENT PROGRESS FORM

II. Formation of Thesis or Dissertation Committee

Note: See reverse side for instructions

Student Name: _______________________________ Date: __________________________

ID No.: __________________________ Field of Study: _______________________________

Degree Program: Master’s ______ or Ph.D. ______

Title of Thesis/Dissertation Research: ____________________________________________

Committee Members (type or print)  Signature

________________________________________  _______________________________ Advisor

________________________________________  _______________________________ Dept. Member

________________________________________  _______________________________ Dept. Member

________________________________________  _______________________________ Dept. Member

________________________________________  _______________________________ Outside Member

________________________________________  _______________________________ Additional Member

Student Signature __________________________ Date __________________________

GASP Approval ___________________________ GASP Committee Signature ______________ Date ______________

2/4/2009
INSTRUCTIONS TO THE STUDENT

This form records your research committee members. Discuss with your Advisor the best qualified individuals from the graduate faculty who can provide constructive input to your research project. Master’s students select a minimum of two members from the Department of Biological Sciences and one graduate faculty from another department. Doctoral students select three members from the Department of Biological sciences and one outside member.

The outside member is a full-time faculty member in an academic department at Florida Tech that is not Biological Sciences. The outside member cannot hold adjunct status and they cannot be affiliated in any official way with Biological Sciences. The role of the outside member is as follows: 1) to serve as a representative of the university to ensure that the rules of the university are followed, 2) to serve as an advocate for the student regarding committee proceedings, 3) to provide an additional level of research expertise and perspective from outside the area of Biological Sciences.

If desired, additional committee members are permitted to serve on a graduate committee based on their appropriate research expertise and willingness to assist the student. Additional members may be solicited from any academic or industrial institution as is deemed appropriate by the student in consultation with his/her advisor. Additional members are not permitted to vote, but are invited to attend all meetings concerning the student’s advancement, although their attendance is not required.

Obtain the signatures of all committee members on the appropriate lines. The student signs this form and submits it to the biology office for approval by the GASP committee.
GRADUATE STUDENT PROGRESS FORM

III. Thesis/Dissertation Title and Proposal Approval

Note: See reverse side for instructions

Student Name: ___________________________ Date: _____________________

ID No.: ___________________________ Field of Study: ___________________________

Degree Program: Master’s ______ or Ph.D. ________

Approval of Thesis/Dissertation Research Proposal:

Title: ____________________________________________________________

committee member name (type or print)

Signature

Advisor

Dept. Member

Dept. Member

Dept. Member

Outside Member

Additional

GASP Approval

GASP Committee Signature

Date

2/4/2009
INSTRUCTIONS TO THE STUDENT

This form records the title of your thesis/dissertation research proposal. It is completed and signed by all committee members immediately following your proposal defense meeting.

Submit this completed form as the Title Page of your proposal to the Biology office for approval by the GASP committee.
GRADUATE STUDENT PROGRESS FORM

IV. Admission to Candidacy

Note: See reverse side for instructions

Student Name: ________________________________ Date: _________________

ID No.: ___________________________ Field of Study: ________________________________

Degree Program: Master’s ______ or Ph.D. _______

1. Completed course deficiencies: ________________ Date

2. Completed 9 hours of graduate courses in good standing (Master’s only): ________________ Date

3. Approval (Master’s) or Completion (Ph.D.) of Program Plan: ________________ Date

4. Completion of Comprehensive Exam (Ph.D. only): ________________ Date

5. Approval of Thesis/Dissertation Proposal (Ph.D. only): ________________ Date

Advisor Signature ___________________________ Date __________________

GASP Approval ________________________________

GASP Committee Signature ___________________________ Date __________________

2/4/2009
INSTRUCTIONS TO THE STUDENT

This form admits the graduate student to candidacy so you can formally begin the research portion of your thesis or dissertation. It should be completed by the end of the first year (Master’s) or by the end of your 5th semester (Ph.D.) of graduate study.

1. Any course deficiencies listed on your Preliminary Conference form must be completed. Give date of completion. If you had no course deficiencies at admission then write ‘NA’ on line in Part 1.

2. For all Master’s students you must have completed at least 9 hours of course work in good standing. Record the date when this requirement was met.

3. Early in your graduate tenure you completed the DEGREE PROGRAM PLAN form. Doctoral students are admitted to candidacy when all formal course work is completed. Master’s students are admitted when the program plan is approved. Give the date that you met this requirement.

4. All doctoral students must have successfully passed the Comprehensive Examination. Refer to your Graduate Student Handbook for details for preparation and administration of the exam. Record the date that you successfully completed the examination.

5. If you are a doctoral student list the defense date of your proposal to your committee.

Submit the completed form to the Biology office for GASP approval.
GRADUATE STUDENT PROGRESS FORM

V. Approval for Thesis/Dissertation Presentation and Final Exam

Note: See reverse side for instructions

Student Name: ___________________________ Date: ___________________________

I.D. No.: ______________ Degree Program: Masters _______ or Ph.D. _________

1. Approval of Thesis/Dissertation for Distribution to Committee Members: I have reviewed and edited the draft thesis/dissertation for content and style and approved distribution to the committee.

   Thesis/Dissertation Title: ___________________________

   Advisor Signature ___________________________ Date ___________________________

2. Submittal of Thesis/Dissertation to the Committee: All committee members must receive a complete draft of the thesis/dissertation a minimum of 4 weeks before the anticipated defense date.

   Committee Members Signature ___________________________ Date received ___________________________
   Advisor
   Dept. Member
   Dept. Member
   Dept. Member
   Outside Member
   Additional Member

3. Approval for Thesis/Dissertation Presentation and Final Exam: Each committee member must approve that your thesis or dissertation is ready for presentation and you are ready for your final exam. You may schedule your presentation and final exam no sooner than 14 days following the last approval date below.

   Committee Member Signatures ___________________________ Date approved ___________________________
   Advisor
   Dept. Member
   Dept. Member
   Dept. Member
   Outside Member
   Additional Member

4. Scheduling of Thesis or Dissertation Presentation and Final Exam: Present this form to the department secretary who will schedule your presentation and final exam date and assist you in submission of the Graduate Program’s ‘yellow’ form “NOTICE OF THESIS OR DISSERTATION DEFENSE AND ORAL EXAMINATION.”

   Presentation Date: ___________ Final Exam Date: ___________ by ___________

   GASP Approval ___________________________ GASP Committee Signature ___________________________ Date ___________________________

2/4/2009
INSTRUCTIONS TO THE STUDENT

This form documents preparation of your thesis/dissertation, promotes interaction with your advisor and committee members, and insures adequate lead time for the formal presentation of your research and final exam. **BE SURE TO READ AND CAREFULLY FOLLOW THESE INSTRUCTIONS OR YOU RISK DELAYING YOUR GRADUATION.** This form must be completed in its entirety at least 2 weeks before the date of your thesis/dissertation presentation. There will be no exceptions to any of the time rules below unless by a special meeting and approval of all GASP Committee members. The student must also submit to the Graduate Programs Office the University form “NOTIFICATION OF THESIS OR DISSERTATION DEFENSE AND ORAL EXAMINATION” a minimum of 14 days before the defense date (see instructions for Part 4 below).

**Part 1.**
Before your thesis or dissertation is sent to your committee members and your presentation approved, you must have completed all research and produced a well-written and near-final draft. Your advisor will read your preliminary drafts and work with you to produce a near-final document. Your advisor must then approve distribution of the near-final draft to your committee members.

**Part 2.**
After your advisor approves distribution of your thesis/dissertation, deliver it to each committee member and have each sign AND CLEARLY DATE part 2 of this form. The earliest possible date for your defense is a minimum of 4 weeks following the last signature date. This waiting period is meant to provide enough lead time for the committee to read your thesis/dissertation and provide to you constructive input.

**Part 3.**
When your committee members have read your thesis/dissertation and are satisfied with its content, they approve scheduling of your presentation and final exam. Have each committee member sign AND CLEARLY DATE part 3 of this form. You may schedule your presentation and final exam no sooner than 14 days after the last signature date in Part 3. This waiting period is meant to provide enough time for the student to address any major corrections of the research and prepare for the defense.

**Part 4.**
Submit this completed form to the Biology office secretary who will schedule the dates for your presentation and final exam, and then send it to the GASP Committee for final approval. The doctoral dissertation defense must be scheduled either immediately following or within 2 working days of the dissertation seminar. The Master’s thesis defense must be scheduled within one week following the thesis seminar.

The University ‘yellow’ form entitled “NOTICE OF THESIS OR DISSERTATION DEFENSE AND ORAL EXAM” will be prepared by the Biology office staff for submission to the Graduate Programs office. The latter form must also be RECEIVED by the Graduate Programs office a minimum of 14 days prior to the examination date. **IT IS THE RESPONSIBILITY OF THE STUDENT TO ALLOW SUFFICIENT TIME FOR PROCESSING BY THE BIOLOGY OFFICE. IT IS STRONGLY RECOMMENDED THAT THE STUDENT SUBMIT FORM V AT LEAST 3-4 WEEKS BEFORE THE SCHEDULED DEFENSE DATE!**
# MASTER'S DEGREE PROGRAM PLAN

**NAME**

**SOCIAL SECURITY NUMBER**

**MAILING ADDRESS**

- Street ( Apt. No.)
- City
- State
- ZIP Code

**DEGREE PROGRAM**

- Major/Title
- Major Code

**DEPARTMENT**

List Florida Tech equivalent with School Source in parentheses for planned transfer credit; indicate “T” in Grade column. Approval of this program plan does not imply approval of transfer credits.

<table>
<thead>
<tr>
<th>Florida Tech Course No.</th>
<th>Florida Tech Course Title</th>
<th>Quarter Credits</th>
<th>Semester Credits</th>
<th>Grade</th>
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- 11.
- 12.

**ELECTIVES**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

**Student Signature**

**Date**

**Department Head Signature**

**Date**

**Faculty Advisor Signature**

**Date**

---

**DISTRIBUTION:** Who – Registrar, Yellow – Department, Pink – Student

Florida Institute of Technology • Office of the Registrar

150 West University Boulevard, Melbourne, FL 32901-6988 • (407) 768-8000, ext. 8116

2/4/2009
REQUEST FOR CHANGE
IN GRADUATE PROGRAM PLAN

DATE __________________________

NAME (PLEASE PRINT) _____________________ SOCIAL SECURITY NUMBER ______________________

(Please print) Last First

MAILING ADDRESS ____________________________

Street ( Apt. No.) City State ZIP Code

DEPARTMENT _____________________ DEGREE PROGRAM _____________________

MAJOR CODE _____________________ GRADUATION TERM _____________________

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<tr>
<th>NEW COURSE NUMBER AND TITLE</th>
<th>QTR/SEM CREDITS</th>
<th>FOR</th>
<th>OLD COURSE NUMBER AND TITLE</th>
<th>QTR/SEM CREDITS</th>
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REASON FOR REQUEST ____________________________

________________________________________________________________________

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________________________________________________________________________

________________________________________________________________________

Student Signature ______________________________ Date __________________________

APPROVED

Faculty Advisor Signature ______________________________ Date __________________________

Department Head Signature ______________________________ Date __________________________

DISTRIBUTION: White – Registrar, Yellow – Department, Pink – Student

Florida Institute of Technology • Office of the Registrar

150 West University Boulevard, Melbourne, FL 32901-6988 • (407) 768-8000, ext. 8116

RG-480-1069
REQUEST TO STUDY AT ANOTHER INSTITUTION
AND TRANSFER OF GRADUATE CREDITS

Social Security Number ________________________ Major Code ____________ Campus _________

Name ____________________________

Address ____________________________ Street ______ City ______ State ______ ZIP ______

Credit is requested for the following graduate courses  □ taken  □ to be taken

At ____________________________ Term(s) ____________________________

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>CREDITS</th>
<th>BASIS*</th>
<th>GRADE</th>
<th>TITLE AND BRIEF DESCRIPTION</th>
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*Q = Quarter  S = Semester

I understand that I must earn/have earned a grade of B or better in each course for which I am requesting transfer credit and that I must have OFFICIAL transcripts sent to the Florida Tech Graduate School Office.

Student Signature ____________________________ Date __________________

DO NOT WRITE BELOW THIS LINE

<table>
<thead>
<tr>
<th>COURSE NUMBER</th>
<th>FLORIDA INSTITUTE OF TECHNOLOGY EQUIVALENT</th>
<th>TRANSFER</th>
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<td>COURSE NUMBER</td>
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TOTAL TRANSFER CREDIT GRANTED

APPROVED: Department Head ____________________________ Date __________________

Dean of the Graduate School ____________________________ Date __________________

DISTRIBUTION: White = Registrar, Yellow = Department or Off-Campus Programs Office, Pink = Student

Florida Institute of Technology • Office of the Registrar
150 West University Boulevard, Melbourne, FL 32901-6948 • (407) 768-8000, ext. 7399

2/4/2009
# Doctoral Program Check List

<table>
<thead>
<tr>
<th>Date Completed</th>
<th>Requirement</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Entrance</td>
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<tr>
<td>2.</td>
<td>Preliminary Comprehensive (Bio, EE, ME, Bus, OE)</td>
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<tr>
<td>3.</td>
<td>Program of Study Submitted during 1st or 2nd term (Policy 2.2.1)</td>
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<tr>
<td>4.</td>
<td>Coursework Completed (Policy 2.2.2)</td>
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<tr>
<td>5.</td>
<td>Doctoral Cmtee established &amp; approved IN WRITING by Academic Unit Head, college/school Dean &amp; Grad School Office no later than 60 days prior to Comprehensive Exam (Pol 2.3.1)</td>
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<td>Name ___________________ Dept ___________________</td>
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<td>6.</td>
<td>Outside Mbr</td>
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<td></td>
<td>Written Comprehensive Exam (Bio, Bus, EE, EvS, MAE, OE, OR, Physics, Sci Ed). <strong>NO LATER THAN 1 YEAR PRIOR TO GRADUATION</strong></td>
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<tr>
<td>7.</td>
<td>Oral Comprehensive Examination Announcement (&quot;the yellow form&quot;) sent to the Office of the Graduate School (no later than 2 weeks in advance) <strong>NO LATER THAN 1 YEAR PRIOR TO GRADUATION</strong></td>
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<tr>
<td>8.</td>
<td>Oral Comprehensive Exam (all majors). <strong>NO LATER THAN 1 YEAR PRIOR TO GRADUATION</strong></td>
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<td>9.</td>
<td>Language Exam (Bio, EvS, Chem, O) [Required by Academic Unit, not Grad School]</td>
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<tr>
<td>10.</td>
<td>Dissertation Proposal Conference (held after Comprehensive Exam [Policy 2.6.1])</td>
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<tr>
<td>11.</td>
<td>Admission to Candidacy (after Comprehensive Exam(s) &amp; Proposal Conference [Pol 2.5])</td>
</tr>
<tr>
<td>12.</td>
<td>Dissertation Registration: Required from 1st semester after Admission to Candidacy (including summer) until Office of the Graduate School accepts minimum 5 copies of approved dissertation. (Policy 2.6.3) Required every semester thereafter (including summer) until GSO accepts (Policy 2.6.2) 24 Credit Hours Dissertation toward the 78 hrs req'd (Pol 2.2.2) Minimum of 15 hours after Admission to Candidacy (Pol 2.2.2)</td>
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<td>13.</td>
<td>Bring first few pages of dissertation to Grad School Office to check format/layout</td>
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<td>14.</td>
<td>Research satisfied (minimum 1 calendar year after Comprehensive Exam(s) [Policy 2.4.3])</td>
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<td>15.</td>
<td>Petition to Graduate submitted (at least 21 weeks prior to graduation. Confirm deadline in &quot;Calendar of Events&quot; at front of current catalog. Recommend pay binding/microfilming fees at the same time. Residency satisfied (2 year minimum registration at Florida Tech [Pol 2.7])</td>
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<td>16.</td>
<td>Dissertation to Committee for review at least 1 month prior to defense</td>
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<td>17.</td>
<td>Bring entire dissertation to Grad School Office to check layout and compliance with requirements</td>
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<td>18.</td>
<td>Dissertation Seminar</td>
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<td>19.</td>
<td>Dissertation Defense Announcement (&quot;the yellow form&quot;) sent to the Office of the Graduate School (at least 2 weeks in advance)</td>
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<td>20.</td>
<td>Get Microfilm Agreement and Survey of Earned Doctorate forms from Grad School Office (essential)</td>
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<td>22.</td>
<td>Payment of Binding fee (required 5 = $60, extras @ $10) and additional microfilming fee (if not earlier)</td>
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<td>23.</td>
<td>Submit to the Office of the Graduate School: Microfilm Agreement Form + 1 extra title page and abstract (350 wd max or THEY will edit 1 copy) Survey of Earned Doctorate Form at least 5 copies of Dissertation (deadline 9:00 a.m. of the day before graduation)</td>
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C:\wpen00\forms\doc_reqs

June 11, 1999

2/4/2009
FLORIDA INSTITUTE OF TECHNOLOGY
Doctoral Program Plan
(To Be Submitted in Triplicate)
(Please Print or Type)

Name:_________________________________ Student #:________________
Address:________________________________ City:____________________
Department:_________________________ Area of Specialization:____________

ADVISORY COMMITTEE:

Chairman ________________________________________________________
Member ___________________________________________________________
Member ___________________________________________________________
Member ___________________________________________________________

Language Requirement (indicate language):______________________________

(Include Transfer Credits — Indicate with "T" in Grade Column)

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<th>Semester</th>
<th>Course #</th>
<th>Course Title</th>
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TOTAL NUMBER OF CREDITS:

Signature: ___________________________ Date: ____________

(student)

Signature: ___________________________ Date: ____________

(faculty advisor)

Approved: ___________________________ Date: ____________

(department head)

Approved: ___________________________ Date: ____________

2/4/2009
Application to Take Doctoral Comprehensive Examination

I intend to take the Doctoral Comprehensive Written Examination this semester. I have completed at least 80% of the formal coursework listed in my Plan of Study. (Please provide a brief statement summarizing your intended research focus.)

I wish to take the examination in the four areas that I have indicated below: (The student with the advice and guidance of the dissertation committee, chooses four areas in which the examination questions will be given)

(Student Signature)  (date)

Contact Information: e-mail____________ Phone____________

(Dissertation Advisor Signature)  (date)

(Committee Member Signature)  (date)

(Committee Member Signature)  (date)

(Committee Member Signature)  (date)

(Committee Member Signature)  (date)

GASP Approval  (GASP Committee Signature)  (date)
Current (not anticipated) OVERALL GPA from Banner

Current (not anticipated) PROGRAM GPA (Calculate if different. Banner does not show.)

(Graduate Policy 1.8.2 requires that MS students have BOTH Overall and Program GPA’s of ≥ 3.0 AT THE TIME the examination is administered.)

Student Name ___________________________ Student Number __________ Major Code __________

Degree Program ___________________________ Academic Unit ___________________________

☐ Paper  ☐ Electronic

Title of Dissertation/Thesis/Design Project _______________________________________

Dissertation/Thesis/Design Project course number __________ Number of hours of P to be credited (per Program Plan) __________

COMMITTEE ADMINISTERING EXAMINATION AND/OR APPROVING DISSERTATION/THESIS/DESIGN PROJECT:

Major Adviser or Examiner of Language Exam ___________________________ Academic Unit ___________________________ Signature ___________________________

Outsider Member ___________________________ Academic Unit ___________________________ Signature ___________________________

Other Member ___________________________ Academic Unit ___________________________ Signature ___________________________

Other Member ___________________________ Academic Unit ___________________________ Signature ___________________________

Language of Language Exam ___________________________ Signature ___________________________

Comments/Weak areas/Additional coursework ______________________________________

____________________________________________________________________________

____________________________________________________________________________

APPROVED Academic Unit Head ___________________________ Date ___________________________

DOCUMENT ACCEPTED Office of Graduate Programs ___________________________ Date ___________________________

COMPLIES WITH POLICY Director of Graduate Programs ___________________________ Date ___________________________

DISTRIBUTION (after all signatures have been affixed):

White – Registrar

Yellow – Academic Unit

Florida Institute of Technology • Office of Graduate Admissions

150 West University Boulevard, Melbourne, FL 32901-6975 • (321) 674-8027

GA-073-00

2/4/2009
3 Application to Doctoral Candidacy

In accordance with the current Florida Institute of Technology catalog, I have fulfilled all stated requirements, and do therefore petition for admission to Doctoral Candidacy. I understand that I must register for at least three hours of dissertation every consecutive semester (including summer) until the Office of Graduate Programs accepts my finished dissertation. A written waiver of the requirement for continuous registration may be submitted in advance of any term during that I will not be using Florida Tech facilities or faculty time. I also understand that I must register for a minimum of 15 dissertation hours during the time of my candidacy.

Student’s Signature ___________________________ Date ____________

4

APPROVED   Academic Unit Head ___________________________ Date ____________

MEETS REQUIREMENTS  Director of Graduate Programs ___________________________ Date ____________

Please fill out Sections 1, 2, 4 for Doctoral Dissertation Proposal Conference Report ONLY, or Sections 1, 3, 4 for Application to Candidacy ONLY

Florida Institute of Technology • Office of Graduate Admissions
150 West University Boulevard, Melbourne, FL 32901-4975 • (321) 674-8027
### Petition for Graduation

**Florida Tech**

**Petition for Graduation**

First Petition Re-Petition Social Security No. __________________________ Date __________________________

**Type or Print Name Clearly**

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Mailing Address __________________________ (street/apt. no.) __________________________ (city) __________________________ (state) __________________________ (ZIP code) __________________________

Local Telephone __________________________ Home Telephone __________________________ Work Telephone __________________________

I am petitioning for graduation at the end of __________________________ (semester/year)

I expect to complete the requirements for the (circle one) A.S. B.A. B.S. M.B.A. M.S. Ed.S. Ph.D. Pay.D.

Degree in __________________________ (major/field) __________________________ University Catalog __________________________ applies (year)

Student Signature __________________________ Date __________________________

Advisor Signature __________________________ Date __________________________

In the event my diploma must be mailed, please use the following address:

<table>
<thead>
<tr>
<th>(street/apt. no.)</th>
<th>(city)</th>
<th>(state)</th>
<th>(ZIP code)</th>
<th>(country)</th>
</tr>
</thead>
</table>

Florida Tech offers certificates called "Pushing Honey Thru" to the spouses of our graduates. If you would like one, please print the name of your spouse: __________________________

(For one) ☐ I will participate in the commencement exercises. ☐ May ☐ December

☐ I will NOT participate in the commencement exercises.

### Cap and Gown Information

**Check One:** ☐ M ☐ F Height _______ ft. _______ in. Weight _______ lbs.

**Circle Cap Size**

<table>
<thead>
<tr>
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<th>Medium</th>
<th>Large</th>
<th>X-Large</th>
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<td>6-1/2-6-3/4</td>
<td>6-7/8-7-1/4</td>
<td>7-3/8-7-5/8</td>
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### Information Pertaining to Graduate Students Only

Previous Degree(s):

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(name of school, state/country where earned)

Graduate:

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(name of school, state/country where earned)

### Payments

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<th>Receipt #</th>
<th>Amount</th>
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<td>2. Matriculation Fee</td>
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<td>5. Late Fee</td>
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DISTRIBUTION (Registrar will distribute all copies): White – Registrar; Yellow – Department, Pink – Student

*Florida Institute of Technology • Office of the Registrar*

150 West University Boulevard, Melbourne, FL 32901-6973 • (407) 796-8000, ext. 8116

2/4/2009
NOTICE OF THESIS OR DISSERTATION DEFENSE AND ORAL EXAMINATION

TO: Office of the Graduate School, Keuper 101, x-8137
FROM: 

<table>
<thead>
<tr>
<th>Approval Signature of Dept Ho/Prog Chair (REQUIRED)</th>
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<tr>
<th>Student Name</th>
<th>Department/Program</th>
<th>Approval Signature of Dept Ho/Prog Chair</th>
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<th>Department/Program</th>
<th>Approval Signature of Dept Ho/Prog Chair</th>
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<th>Department/Program</th>
<th>Approval Signature of Dept Ho/Prog Chair</th>
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<th>Approval Signature of Dept Ho/Prog Chair</th>
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Submit NO LATER THAN 14 days before defense/exam

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...
EXAMINATION REPORT

Current (not anticipated) OVERALL GPA from Banner.

Current (not anticipated) PROGRAM GPA (Calculate if different. Banner does not show.)

Graduate Policy 1.5.2 requires that MS students have BOTH Overall and Program GPA’s of 3.0 AT THE TIME the examination is administered.

Student Name ______________________ Student Number ______________________ Major Code ______________________

Degree Program ______________________ Academic Unit ______________________

☐ Paper ☐ Electronic

Title of Dissertation/Thesis/Design Project ______________________________________________________________

Dissertation/Thesis/Design Project course number ______________________ Number of hours of P to be credited (per Program Plan) ______________________

COMMITTEE ADMINISTERING EXAMINATION AND/OR APPROVING DISSERTATION/THESIS/DESIGN PROJECT.

Major Advisor or Examiner of Language Exam Academic Unit Signature

Outside Member Academic Unit Signature

Other Member Academic Unit Signature

Other Member Academic Unit Signature

Other Member Academic Unit Signature

Language of Language Exam

Comments/Weak areas/Additional coursework ______________________________________________________________

__________________________________________________ Date

APPROVED Academic Unit Head ______________________

DOCUMENT ACCEPTED Office of Graduate Programs ______________________ Date ______________________

COMPLIES WITH POLICY Director of Graduate Programs ______________________ Date ______________________

DISTRIBUTION (after all signatures have been affixed):

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OA-179-900

2/4/2009
DEPARTMENT OF BIOLOGICAL SCIENCES
FLORIDA INSTITUTE OF TECHNOLOGY

Graduate Student Checkout Form

Date: ____________________________

Name: ____________________________ Student Number: ____________

Forwarding Address: ____________________________

Graduation Date: ________________

All items must be returned and proper signature obtained.

Approval Signature

1. Research Notebooks. ____________________________ Faculty Advisor
   Alex Lindsay

2. All items checked out of stockroom. ____________________________

3. All keys. ____________________________
   Carolyn Sorrell

4. Class record books (Grad. Assistants). ____________________________
   Carolyn Sorrell

Student Signature ____________________________
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