

Graduate Student Handbook

**Department of Biological Sciences
Northern Arizona University**

Academic Year 2006 - 07

“When you come to a fork in the road, take it!”
Yogi Berra

**“The real cycle you’re working on
is a cycle called ‘yourself’.”**

From: Zen and the Art of Motorcycle Maintenance.

GRADUATE STUDENT HANDBOOK

Department of Biological Sciences, Academic Year 2006 - 07
Incorporating policy updates of the University Graduate Committee

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INTRODUCTION

Welcome to NAU and the Department of Biological Sciences. We recognize the challenges associated with relocating to a new place, institution, and program, and hope that this handbook will ease both the process of relocation and serve as a valuable source of information throughout your stay. This edition of the Handbook incorporates the most recent policy revisions by the Department faculty and University Graduate Committee.

At present the Department of Biological Sciences includes over 40 faculty, 24 adjunct faculty, approximately 100 graduate students, 27 office, stockroom and technical staff, and about 800 undergraduates dispersed among majors in Biology, Biology Secondary Education, Botany, Microbiology, Zoology and Environmental Science. All segments of the Department share a long history of teamwork on both professional and social levels; all contribute significantly to the Department's functions and well-being.

We believe that graduate education provides training for a profession, and we expect students to contribute fully to the Department as professionals. This includes contributing substantially to departmental affairs, excelling in course performance and teaching roles, serving as thoughtful, responsible representatives of the Department and University, and both receiving and providing constructive criticism during interactions with faculty and student colleagues.

Many sources of information about Flagstaff, NAU and the Department are available to you. The Chamber of Commerce is a short walk from campus and provides numerous brochures about life in and around Flagstaff. General information and regulations concerning graduate study at NAU, as well as courses offered by the Department, are described in the "Graduate Catalog" found via the NAU homepage (www.nau.edu/gradcol/) or the Office of Graduate Admissions and Academic Services, room 107 Ashurst Building. The NAU Graduate Catalog also contains a wealth of information about the University and the services it provides. On a more local scale, faculty and graduate students can assist you in all matters concerning your full integration into the program. You need to become thoroughly familiar with this Graduate Student Handbook and the on-line Graduate Catalog. In conjunction with the Graduate Catalog, this Handbook provides a concise and detailed statement of current regulations and guidelines you must follow during your graduate career at NAU. The Handbook will accurately describe most information relevant to you, but changes may occur prior to your arrival or during your studies in the Department. Subsequent alterations in policy or process may supersede previous procedures, subject to the approval of your advisory committee. We must emphasize that it is the responsibility of the student to adhere to the regulations and guidelines described in these publications, and not the responsibility of the Faculty Advisor.

TO WHOM THE HANDBOOK APPLIES

The contents of this handbook are applicable to all students entering the Department in the Fall semester, 2005 and thereafter. Students who entered before this date should use the recommendations and requirements herein as far as is possible, but have the option of continuing under the requirements in effect at the time they were admitted to their current program.

ADMISSION TO BIOLOGY GRADUATE PROGRAMS

The Department offers two degree programs: Master of Science, and Doctor of Philosophy. The Master of Science program provides training in the biological sciences through coursework and research experience. The Doctor of Philosophy program provides advanced training in research through focused coursework and extensive research experience. The Master of Arts in Teaching program is being grandfathered out in Summer 2005; interested individuals should consider the Master of Arts in Science Teaching (MAST program) coordinated at the Center for Science Teaching and Learning. Other sections of this Handbook describe these programs and their associated requirements in detail.

Entry into the Department's graduate programs requires application to and acceptance by both the Graduate College and the Department.

General requirements for admission to the Graduate College are given in the Graduate Catalog (on-line). A completed application to the Department's Graduate Program consists of: completion of the Graduate College's on-line application form; satisfactory course grades; three letters of recommendation addressing qualifications for advanced studies; a statement of the student's interests, professional goals, and research and teaching experience; and scores on the general Graduate Record Examination. Advanced subject GRE scores are not required, but if provided, will be considered as part of an application. GRE scores must come to the NAU directly from E.T.S. Self-reported scores are not accepted. Most importantly, admission will depend upon the availability of a Faculty Advisor. In addition, for the M.S. and Ph.D. degrees, funding for the student, adequate space, research resources and equipment must also be available.

Because of the limitations on admissions and the necessity for a faculty member to support acceptance, a meeting with potential faculty advisors prior to admission is strongly recommended. Prospective students should contact faculty directly during a visit to campus. If this is not possible, contact should be made at professional meetings, or by letter, e-mail or telephone. Applicants should be prepared to discuss their backgrounds, specific areas of interest, and career goals.

Graduate degrees are awarded only to students holding Graduate Regular Standing. This status is conferred when a student has fulfilled all requirements for admission to both the Graduate College and to the specific program within the Department, and has been recommended by the Department for admission to the Graduate College. Any "conditional admission" criteria must be satisfied to graduate.

Graduate credit may be earned by students holding Graduate Provisional (Conditional) Standing or Graduate Non-Degree Standing. Provisional standing may be assigned to a student who, for some reason, is not qualified for Graduate Regular standing. It may be that the student lacks prerequisites for the program, did not file all necessary transcripts, has a low cumulative undergraduate GPA (i.e., less than 2.9), or has some other deficiency. Non-Degree standing is for students who do not intend to pursue a degree program. Normally no more than 12 credit hours of graduate credit earned while the student has Graduate Provisional or Non-Degree standing may be applied toward a graduate degree. Please note that students who have completed hours while on Graduate Non-Degree Standing and who have fully completed application procedures for Regular Standing are not assured admission to the graduate program of the Department. They must be considered for admission along with all other applicants.

GRADUATE PROGRAM COMMITTEE (GPC) OF THE DEPARTMENT

Oversight of graduate studies in the Department resides with the Graduate Program Committee (GPC), Associate Chair (Director) for Graduate Studies (ex officio chair), and Department Chair. The GPC includes a graduate student member recommended by the Biology Graduate Student Association (BGSA) with voting status except in admissions and assistantship decisions. The GPC is responsible for periodic review of policies and procedures concerning the graduate programs of the Department. Revisions to policies and procedures are subject to approval by the Department Chair, ratification by the faculty, and final approval by the Dean of the Graduate College. The Associate Chair for Graduate Studies is also responsible for monitoring the timely completion of degree requirements as outlined in the student's Program of Study and this Handbook in conjunction with the student's Major Professor and Advisory Committee.

Admissions are overseen by the GPC who recommend admission of applicants to specific programs, and recommend to the Department Chair candidates for different types of financial support. Applications for admissions are normally reviewed in the Spring Semester (application deadline is February 15th) of each academic year for admission the following Fall. Sometimes, though not typically, applications may be considered for Spring admission if completed by October 15th. Recommendations for admission and financial support are made to the Department Chair for final action. The Department Chair, in consultation with the Associate Chair for Graduate Studies, balances committee recommendations with overall curricular and programmatic needs of the Department.

GETTING STARTED

Here are a few initial items requiring students' attention upon arrival. These and more will be covered at fall orientation programs of the Graduate College and Department.

- **University ID card:** After registering for classes, your photo ID can be obtained at room 115 of the University Union in the central area of the campus.
- **E-mail:** The department staff utilizes e-mail for weekly distribution of a newsletter, *UPDATE*. You will need to apprise the department office of your e-mail address to be kept informed of issues, topics, meetings, funding opportunities, deadlines, workshops, etc. important to your graduate student functions in the department and university. An e-mail user ID will be created for you upon matriculation. To set up your e-mail password, go to www.nau.edu/password or call the Academic Help Desk at 523-9294, or go to the Learning Resource Center, building #61.
- **Mailbox:** Graduate students in residence will have a mailbox available to them in the department mailroom. See the department office staff.
- **Keys:** Building keys are handled by the department office staff.
- **Office space:** Consult with your Faculty Advisor regarding desk space and the phone in her/his research area. Teaching Assistants are prioritized for shared office space.
- **Photocopies:** See the department office staff for current procedures.
- **New Hire Packet:** If you are supported on a Graduate Teaching or Research Assistantship, you will need to complete a "New Hire Packet". This can be located via the Human Resources website, <http://hr.nau.edu/m/> The New Hire Packet is among their "Forms Index."
- **Parking:** Permits to park on campus are purchased at Parking Services in the Centennial Building (#91).
- **Pay Day:** Alternate Fridays are pay days. Direct deposit is encouraged, your pay statement is on-line through the Human Resources web site. If you opt for a "hard copy" pay check, it will be mailed to your home address on record at Human Resources.

• **Residency Status:** If you wish to establish Arizona residency for tuition purposes, contact the Graduate College for details and the Petition to Change Residency Status (or see the Graduate College's website for "Current Students").

FACULTY ADVISOR

Throughout your studies here you will work most closely with your Faculty Advisor (major professor). This relationship will be established by mutual agreement based on your shared interests and available resources. Your Faculty Advisor was designated prior to your arrival, and this advisor will ordinarily be permanent; however, the student may change advisors if deemed advisable after consultation with the current advisor, the potential advisor, and the Associate Chair for Graduate Studies. It is imperative that you work closely with your Faculty Advisor to plan your program of study and to insure that requirements are met in a timely manner and in accordance with the policies of the Department and University.

Each Faculty Advisor will have individualized expectations or lab policies for the students training in her/his research program. You should discuss these right away with your advisor so that you both have a clear starting point, realizing that changes may evolve as your graduate program develops. Regular, clear and open communication can prevent misunderstandings with your advisor (and Graduate Advisory Committee). This is very important; do not disregard topics such as:

- mutual expectations of you as a trainee and your advisor as a mentor,
- good practice and ethics in scientific research,
- animal care and use regulations, the IACUC at NAU,
- protection of human subjects and associated regulations, the IRB committee,
- safety/required training for all manners of handling radioactive and/or hazardous materials,
- data notebooks, ownership of data and other research materials,
- order of authorship on future manuscripts and presentations,
- financial support: stipend (amount & years), travel to meetings, supplies, etc.
- post-degree letters of reference/recommendation, assistance with placement.

GRADUATE ADVISORY COMMITTEE COMPOSITION

The Graduate College's policies on minimal composition of Graduate Advisory Committees are:

- a) three faculty for master's committees (one of the three can be from outside the home department), and
- b) four faculty for doctoral committees (one of the four must be from outside the home department).

For doctoral advisory committees, several additional Graduate College policy statements are included in the section DOCTOR OF PHILOSOPHY DEGREE (Ph. D.).

On April 11, 2001, the Department faculty adopted the following policy to help clarify who are faculty "inside" vs. "outside" the Department of Biological Sciences for the purposes of a Graduate Student Advisory Committee. Policy update, by Department faculty vote: *The majority of members of a Graduate Student Advisory Committee will be composed of faculty with voting status in the Department of Biological Sciences.*

In the Fall 2002 semester, the Associate Dean of the Graduate College also affirmed that Faculty Emeriti of the Department are considered "inside" the department for the purposes of a Graduate Student Advisory Committee.

MASTER OF SCIENCE DEGREE IN BIOLOGY (M.S.)

Faculty Advisor and Graduate Committee

A Faculty Advisor for a student is selected at the time a student is admitted into the program. The student, Faculty Advisor, and the GPC participate in the process. The advisor and student then arrange a class schedule for the first semester. As indicated earlier, it is possible for the student to change advisors after consultation with the current advisor, the potential advisor, and the Associate Chair for Graduate Studies.

Before mid-semester of the first semester in residence, a Graduate Advisory Committee will be formed by the student. The graduate student, in consultation with the advisor, should select a group of potential committee members who can best advise the student in the area of research. The student should then discuss her/his plans with these faculty members to determine their willingness to serve on the Graduate Advisory Committee. The committee is composed of at least three members: the Faculty Advisor and two other faculty members, at least one of the latter being from the Department of Biological Sciences. The student submits a letter (cosigned by the faculty advisor) to the Department Chair, suggesting the committee members to be appointed.

First Committee Meeting: For students entering the program in the fall semester, a committee meeting should be held before the end of November. For students entering in the spring semester the first meeting should be held before the end of April. All students must ensure that advisory committee meetings are confirmed one month ahead of the scheduled date. The first meeting is to plan a program of courses and discuss a thesis prospectus. This prospectus provides the committee with the following information:

- a) The major questions or hypotheses to be addressed
- b) The significance of these questions
- c) The extent of current knowledge in the area of research
- d) The materials and methods to be used to answer the questions
- e) The schedule for completion of stages of the work

Before the first meeting of this committee, the student should complete portions of the **Master of Science Program Form, Bio Form 3**, (available in the Biology Office and department website) in consultation with the Faculty Advisor. Copies should be provided to each committee member before the meeting. After it is signed by the Graduate Advisory Committee and Associate Chair for Graduate Studies, the original copy will be placed in the student's permanent file (located in the Biology Office). Completed copies of the program form will be distributed by the Biology Office to the Faculty Advisor, the Associate Chair for Graduate Studies, and to the Dean of the Graduate College. Changes to this program plan must be approved by the advisor, committee members and Associate Chair for Graduate Studies.

Subsequent Meetings: Students will arrange a meeting of the Graduate Advisory Committee at least once per academic year in order to assess progress, discuss research results and/or future research plans. All students, after their first year in a program, must arrange for an advisory committee meeting in the fall semester. Preparation for the meeting involves a full report of the past year's research including analysis of data and a well-developed plan of research for the next year. This fall meeting would include preparation of the student's **Financial Request/Progress Report Form, Bio Form 10**. The Bio Form

10 is essential before evaluation commences for continued financial support. *Students who neglect the timely completion of this annual responsibility might not be considered for continued financial support. After February 15th, a list of TA requests for continuing students is derived from completed Form 10s.*

At each successive annual meeting the student will file a Form 10, copies of which will go in the student's departmental file and to the student (this form is available in the departmental office). A statement on this form, made by the Faculty Advisor and in concurrence with the committee's view, will clarify whether progress is satisfactory or unsatisfactory. If progress is unsatisfactory, the student will be given a warning and one semester in which to improve this status. If progress remains unsatisfactory, the student will be dismissed from the degree program and any appointment with financial support that the student holds will be discontinued. The student has recourse to normal departmental grievance procedures (see section on Grievance Procedures).

Course Requirements: Students in the M.S. programs must complete a minimum of 32 credit hours. At least 3 but not more than 6 of these 32 hours may be thesis research (BIO 699); however, there is no upper limit on the number of credit hours of thesis research that may be taken. As part of the 32 hours, a student may take no more than two 400-level courses. An approved program of study may include up to 12 combined hours of Bio 685 and/or 697 toward the degree requirements. Student teaching may not contribute to the 32 hours of course work required for the M.S. degree.

Petitions for exceptions to the program of study stated on the Master of Science Program Form must have prior approval and bear the signatures of the student's advisor, Graduate Advisory Committee, and Director of Graduate Studies. If the student's Graduate Advisory Committee determines a student to be deficient in some area(s), the committee may designate undergraduate courses to be taken that are not to be included in the required 32 credit hours. In all matters concerning change in program plans require approval by the Associate Chair for Graduate Studies.

Students are expected to complete courses listed on their program before taking non-required courses. Students may not enroll in courses during the summer, other than for research or thesis credit, without the explicit consent of their Graduate Advisory Committee. During the summer, students supported on any form of Graduate Assistantship must register for at least one hour of thesis credit (BIO 699) unless enrolled in other Biology courses. This means one credit hour each in Summer Sessions I and II, or one credit hour in the 10-week Summer Session (preferred). Graduate Assistants no longer have a 20-hour maximum work limit during the summer months. To be exempt from paying FICA tax on university paid summer salaries, graduate students need to be enrolled as least half time - 2 credit hours (per Session I and II, OR for the 10-week summer session). Questions regarding summer enrollment requirements and policies should be directed to the office of the Vice Provost for Research and Graduate Studies (the Graduate Dean).

Seminar Requirements: All graduate students are expected to attend general departmental seminars (no course designation) while in residence. Student evaluations will take into account such professional involvement in Departmental activities. In addition, two seminar courses (BIO 698) on open enrollment topics are required of all M.S. students. Seminars intended for students in a specific and limited research group do not satisfy the "Seminar Requirement." However, these credits may be included in the 32 hours of course work toward the M.S. Degree.

Graduate students are expected to attend all department seminars (usually Monday afternoons at 3:30 p.m.). The exposure to a wide range of ideas and an opportunity to meet and interact with other scientists is a valuable experience for graduate students, both when the speaker is in one's own field and

when she/he is not. Furthermore, all members of the department, including graduate students, have a professional responsibility to show interest in speakers whom the department has invited to present their work, and to be involved with entertaining the visitor.

Research Requirements and Thesis: The student must submit a thesis based on original research and must complete between 3 and 6 credit hours of thesis research (BIO 699). The thesis should be of such quality that major portions of it are publishable in a national research journal in the field of study. Writing the thesis as a research paper or papers for submission to a specific journal is strongly recommended. For format guidelines, please refer to the sections of the Graduate College home page for Current Students. The Thesis and Dissertation Coordinator/Format Editor of the Graduate College is your source for: current thesis requirements in terms of format, style and deadlines, the "format check," bindery and microfilming requirements (fee applies to microfilming). The Format Editor is available at the Graduate College offices.

Before the thesis is submitted to your Graduate Advisory Committee, it must have been reviewed by the Faculty Advisor, revised by the student, and approved again by the Faculty Advisor. The initial submissions of the thesis to the committee needs to be made well in advance of the Final Oral Examination (minimum of four weeks) in order to allow for further revisions based upon the committee members' recommendations. Committee members must provide timely feedback on the thesis within two weeks if their changes are to be incorporated into the final draft of the thesis. The thesis, as close as possible to being a final copy, including all figures, tables, and references must be distributed to all committee members at least seven working days before the date of the Final Oral Examination. Any committee member who considers the thesis needs more work may demand that the Final Oral Examination be rescheduled. If the entire committee concurs, then a new date for the oral will be set at that meeting.

M.S. students are required to present results of their research in a formal presentation to a departmental group or at a scientific meeting. It is recommended that, when possible, the final oral exam (see below) be held immediately following such a presentation.

When the thesis is approved, the signed (blue ink) original plus three copies must be submitted to the Graduate College, and binding fees paid. The Graduate College arranges for binding of the theses and distributes the copies as follows: The original copy to the University Archives, one copy to the University Library for circulation, one copy to the Department of Biological Sciences, and one copy to the Faculty Advisor. Additional copies may be bound at the student's request. To avoid having to sign up for additional credit hours after the semester in which you defend, you must submit the final approved copies of your thesis or dissertation to the Graduate College by the last day of the semester in which you complete your defense. If you do not meet this deadline, you must register for 3 hours of thesis (699) credit each semester after your defense until you submit your final copies to the Graduate College. For more information, see the section on Thesis and Dissertation Requirements in the Graduate Catalog.

Final Oral Examination: Each student will take this examination. It is designed to test a student's knowledge in biology and competence in research, as well as the adequacy of the thesis. The examination is given by all members of the student's Graduate Advisory Committee. This exam typically lasts 2-3 hours, with half the time devoted to knowledge in biology and half to research and thesis. All faculty members of the Department are free to attend the oral examination and may ask questions if invited to do so by the Chair of the Graduate Advisory Committee.

In preparation for this examination the student must observe the following points:

- A copy of the thesis in virtually final form must be distributed to all committee members at least seven working days before the date of the examination.
- The date for the examination must be arranged by the student so that all members of the committee can attend. Such a date must fall within the Fall or Spring semesters (excluding Final Examination Week), and faculty must have a confirmed time, date, and place in writing from the student.
- For students wishing to graduate at the spring graduation, the exam must be taken at least four weeks before the end of the last semester of the student's enrollment, in order to allow time for any necessary changes before submitting the final thesis copies to the Graduate College.
- Students must be enrolled during the semester in which they submit the thesis, preferably for 3 credit hours of BIO 699.
- The **Application for Graduation** should be made to the Graduate College no later than the second week of the semester of graduation. The Graduate College can provide the deadline for receipt of this application; there is a graduation fee.
- With meetings of your Graduate Advisory Committee scheduled each academic year, it is expected that each member will be familiar with the research progress and with early drafts of the thesis. Frequent consultation with your advisor and committee members is encouraged throughout your research and preparation of the thesis.
- Prior to the Final Oral Examination, the student will provide to each committee member a list of courses taken for the M.S. degree; i.e., a current copy of your approved program plan, Bio Form 3.

Questions in the examination will evaluate the candidate's understanding of the basic principles of biology and specific aspects of the designated discipline. Questions on research and thesis may relate to points of clarification, analytical procedures, basic biology and systematics of the species studied, possibilities for future research and publication, and areas where research could be improved. Each committee member will keep notes on all questions asked, record satisfactory or unsatisfactory for the answer, and make a general summary of the student's performance. A pass or fail vote is recorded by secret ballot before any discussion. A student must obtain at least two-thirds of the votes in favor of passing the oral exam and accepting the thesis. The Chair of the Graduate Advisory Committee (the Faculty Advisor) will report the result of this exam in writing to the Associate Chair for Graduate Studies and to the Dean of the Graduate College on **Bio Form 6, Results of Final Oral Examination for Master's Degree**, provided in the Biology office. If the examination is failed it may be repeated only once.

Evaluation of Progress and Grade Requirements: The student's Graduate Advisory Committee will meet to evaluate the student once each year. A student is expected to maintain a grade point average of B or better throughout the course work for the M.S. degree, and to make significant progress in research each semester. No more than 6 credit hours of course work with a grade of C may be used toward the M.S. requirements. Accumulation of more than 6 credit hours of graduate course work with a C grade or below will result in the termination of the student's M.S. program regardless of the grade point average. A terminated student may petition the Graduate College for readmission based on their individual circumstances. It would be the student's responsibility to articulate their case and explain why an exception is warranted. The minimum cumulative grade point average in graduate courses is 3.00 (=B) for graduation. Students with, or applying for, financial support must maintain a grade point average of 3.00 or better. Students are expected to complete courses listed on their approved program plan before taking other courses. A Financial Request/Progress Report Form (Bio Form 10) will be filed once per year by the student after the annual meeting with the Graduate Advisory Committee. This progress report must be on file before evaluation concerning continued funding can take place (February

15th). A copy will be placed in the student's permanent file, and a copy given to the student.

Time Limits (revised by the University Graduate Committee, 9/16/99):

You must complete all requirements for the M.S. degree within a 6-year period, including time as a non-degree seeking graduate student. If you take courses from other institutions and transfer them to your program at NAU, they must also be taken within the 6-year period.

One extension of the time to complete degree requirements (of up to one year) may be granted if there are compelling extenuating circumstances. Extensions may be granted for a variety of reasons which may include, but are not limited to, job relocation, military duty, pregnancy, illness, a serious accident, divorce, or other personal tragedies within the immediate household.

If you wish to petition for an extension of the 6-year limit, you must request an extension on the appropriate form (available from the Graduate College). Your advisor and the department chair must support your petition by signing the form.

Credit earned at Northern Arizona University at a date prior to the six-year period in which the degree is earned may be used for the degree if the student takes steps necessary to renew the credit. Credit may be renewed by attending the class for the entire semester or summer session and taking the midterm and final examinations. Forms to verify renewal of credit are available from the Graduate College.

Credit Load: The minimum full-time credit load for a student not on a graduate assistant appointment is 9 hours. Students on half-time assistantships (20 hours per week) are required to carry 9 (and no more than 12) credit hours.

A minimum of 6 credit hours per semester and a total of one credit hour in the summer are required of a student who wishes to have a desk and space assigned in the Department, and who wishes to use departmental equipment. A student must be enrolled for at least one (1) credit hour, preferably 3 hours, of BIO 699 in the semester or summer session when the final oral exam is taken and/or the thesis is completed.

THE MASTER OF ARTS IN TEACHING BIOLOGY (M.A.T.)

Note: This degree program will end in Summer 2005 – see the Master of Arts in Science Teaching (MAST) degree program in the Center for Science Teaching and Learning. Students in the MAST may opt to complete the degree.

Faculty Advisor and Graduate Committee: At the time of admission to the program, a Faculty Advisor is selected. The Faculty Advisor and student will meet and arrange a class schedule for the first semester and complete portions of the **M.A.T. in Biology Program Form, Form Bio 4** (a copy is available in the Biology Office).

Before mid-semester of the first semester in residence, a Graduate Advisory Committee will be formed by the student. The graduate student, in consultation with the advisor, should select a group of potential committee members who can best advise the student. The student should then discuss her/his plans with these faculty members to determine their willingness to serve on the Graduate Advisory Committee. The committee is composed of at least three members: the Faculty Advisor and two other faculty members, at least one of the latter being from the Department of Biological Sciences. The student submits a letter (cosigned by the faculty advisor) to the Department Chair, suggesting the committee members to be appointed.

Before the end of the student's first semester, the **M.A.T. in Biology Program Form (Bio Form 4)** and a thesis outline (when applicable), will be submitted to the Graduate Advisory Committee for its approval. Copies should be provided to each committee member before the meeting. After the program plan is signed by the Graduate Advisory Committee and Associate Chair for Graduate Studies, the original copy will be placed in the student's permanent file (located in the Biology

Office). Completed copies of the approved program plan (Bio Form 4) will be distributed by the Biology Office to the Faculty Advisor, the Director of Graduate Studies, and to the Dean of the Graduate College. Changes to this program plan must be approved by the advisor, committee members and Associate Chair for Graduate Studies.

OPTION 1: The Thesis Plan: The Thesis Plan requires a total of 32 semester hours: a minimum of 3 hours of thesis credit (Biology 699); an approved minor of 9 hours of education courses; and 20 hours of other approved course work. The course work will normally be in graduate biology classes, but may include supporting courses selected in consultation with the student's Graduate Advisory Committee. A final oral examination is required.

The student will meet with the Faculty Advisor and the Graduate Advisory Committee at least once each year to assess progress and future plans. A written statement concerning the committee's estimate of student progress will be placed in the student's file and a copy given to the student. If progress is estimated to be unsatisfactory, a written warning will be given to the student and a copy will be placed in the student's file. The student will be given one semester to rectify the situation. If, after this additional semester, progress is still unsatisfactory, the student will be dismissed from the M.A.T. degree program and from any appointment with financial support. The student has recourse to normal departmental grievance procedures (See Section on Grievance Procedures).

The submitted thesis may be based on the student's original research on a purely biological problem, or on a problem in biology education. The thesis should be of such quality that major portions of it are publishable in a national journal in the field of study. Writing the thesis as a research paper or papers for submission to a specific journal is strongly recommended. Please refer to the sections of the Graduate College home page section for Current Students for format information. The Thesis and Dissertation Coordinator of the Graduate College is your source for: current thesis requirements in terms of format, style and deadlines, the "format check," bindery and microfilming requirements. The Coordinator is available at the Office of Graduate Admissions and Academic Services.

Final Oral Examination: All M.A.T. students are required to take a final oral examination administered by the Faculty Advisor and Graduate Advisory Committee. The oral examination must be arranged by the student so that all members of the committee can attend. Such a date must fall within the fall, spring or summer semesters (excluding Final Examination Week), and faculty must have a confirmed time, date, and place, in writing from the student at least two weeks in advance.

Prior to the Final Oral Examination, the student will provide each committee member a list of the courses taken for the M.A.T. degree, i.e., a current copy of your approved Program Plan, Bio Form 4. M.A.T. students who have selected the Thesis Plan are required to give a formal presentation on their research to a departmental group or at a scientific meeting.

Before the thesis is submitted to your Graduate Advisory Committee, it must have been reviewed by the Faculty Advisor, revised by the student, and approved by the Faculty Advisor. The initial submissions of the thesis to the committee needs to be made well in advance of the Final Oral Examination (minimum of four weeks) in order to allow for further revisions based upon the committee members' recommendations. Committee members must provide feedback on the thesis within two weeks if their changes are to be incorporated into the final draft of the thesis. The thesis, as close as possible to being a final copy, including all figures, tables, and references must be distributed to all committee members at least seven working days before the date of the Final Oral Examination. Any committee member who considers the thesis needs more work may demand that the Final Oral Examination be rescheduled. If the entire committee concurs, then a new date for the oral will be set at that meeting.

When the thesis is approved, the signed (blue ink) original plus three copies must be submitted to the Graduate College, and binding fees paid. The Graduate College arranges for binding of the theses and distributes the copies as follows: The original copy to the University Archives, one copy to the University Library for circulation, one copy to the Department of Biological Sciences, and one copy to the Faculty Advisor. Additional copies may be bound at the student's request. To avoid having to sign up for additional credit hours after the semester in which you defend, you must submit the final approved copies of your thesis or dissertation to the Graduate College by the last day of the semester in which you complete your defense. If you do not meet this deadline, you must register for 3 hours of thesis (699) credit each semester after your defense until you submit your final copies to the Graduate College. For more information, see the section titled Thesis and Dissertation Requirements in the Requirements for Graduate Degrees section of the Graduate Catalog.

The Final Oral Examination under the thesis plan will normally take about three hours. Approximately one-half of the examination will cover the student's knowledge of biology and its application to the classroom. Approximately one-half will cover the thesis. During the oral examination, each committee member will make written notes of the student's performance. After the completion of the examination, the committee will, by secret ballot, vote to pass or fail before any discussion takes place. A two-thirds vote is required to pass. The Chair of the Graduate Advisory Committee (Faculty Advisor) will report

the results of the exam in writing to the Director of Graduate Studies and to the Dean of the Graduate College using **Bio Form 6, Results of Final Oral Examination for Master's Degree**, available from the Departmental Office. A copy of the results will be placed in the student's file. A failed oral examination may be repeated only once.

OPTION 2: The Extended Course Work (Non-Thesis) Plan: The Extended Course Work Plan requires a total of 36 credit hours: an approved minor of 12 credit hours of education courses and 24 credit hours of other approved course work. The 24 hours of course work will normally be in graduate biology classes, but may include supporting courses selected in consultation with the student's Graduate Advisory Committee. A final oral examination is required.

As part of the Graduate Program Assessment Plan for the M.A.T. degree, the following two components were adopted by the faculty in Spring 2000.

Personal Program Statement

At the outset of the program and in consultation with the M.A.T. Faculty Advisor, students in the non-thesis option will prepare a 1 - 2 page *Personal Program Statement* which will tie their formal course plans to their career objectives in the M.A.T. degree program. This *Personal Program Statement* will become a part of the portfolio, described next, and may serve as a source of questions by the student's Graduate Advisory Committee during the Final Oral Examination.

M.A.T. in Biology Writing and Learning Portfolio

In the non-thesis option, effective writing will be evidenced by preparation of a graduate program *M.A.T. in Biology Writing and Learning Portfolio* comprised of writing projects and assignments from Biology and supporting courses taken for the M.A.T. This portfolio will be prepared in consultation with the M.A.T. Faculty Advisor and be reviewed, discussed and may serve as a source of questions by the student's Graduate Advisory Committee during the Final Oral Examination. The portfolio will become a part of the student's departmental file.

The student will meet with the Faculty Advisor and the Graduate Advisory Committee at least once each year to assess progress and future plans. A written statement concerning the committee's estimate of student progress will be placed in the student's file and a copy given to the student. If progress is estimated to be unsatisfactory, a written warning will be given to the student and a copy will be placed in the student's file. The student will be given one semester to rectify the situation. If, after this additional semester, progress is still unsatisfactory, the student will be dismissed from the M.A.T. degree program and from any appointment with financial support. The student has recourse to normal departmental grievance procedures (See Section on Grievance Procedures).

Final Oral Examination: All M.A.T. students are required to take a final oral examination administered by the Graduate Advisory Committee. The oral examination must be arranged by the student so that all members of the committee can attend. Such a date must fall within the fall, spring or summer semesters (excluding Final Examination Week), and faculty must have a confirmed time, date, and place in writing from the student at least two weeks in advance.

Prior to the Final Oral Examination, the student will provide each committee member a list of the courses taken for the M.A.T. degree, i.e., an up-to-date copy of your Program Plan, Bio Form 4.

The Final Oral Examination for the extended course work plan will normally take two hours, and will cover the student's knowledge of biology and the application of this knowledge to the classroom. During the oral examination, each committee member will make written notes of the student's performance. After the completion of the examination, the committee will, by secret ballot, vote to pass or fail before any discussion takes place. A two-thirds vote is required to pass. The Chair of the Graduate Advisory Committee (Faculty Advisor) will report the results of the exam in writing to the Director of Graduate Studies and to the Dean of the Graduate College using **Bio Form 6, Results of Final Oral Examination for Master's Degree**, available from the Departmental Office. A copy of the results will be placed in the student's file. A failed oral examination may be repeated only once.

Course Requirements for Both M.A.T. Options: A student may not include more than two approved 400-level courses in the program plan for the M.A.T. The remainder of the courses must be at the 500-level or higher. If the Graduate Advisory Committee determines a student to be deficient in some area(s), the committee may designate undergraduate courses to be taken and which are not to be included in the minimum number of credit hours required under either plan.

Students without appointments may carry up to 16 hours of credit during each semester of the academic year (9 hours is considered a full load), and 6 hours during each 5-week summer session. Students with half-time (20 hours per week) appointments must carry 9 - 12 hours during each academic semester.

A student must be enrolled for at least one (1) credit hour, preferably 3 hours, of thesis or approved course work in the semester or summer session when the final oral exam is taken and/or the thesis is completed.

Courses listed on the M.A.T. in Biology Program Form may not be changed without the consent of the Faculty Advisor, Graduate Advisory Committee and Associate Chair for Graduate Studies. If changes are made, a letter written by the student and signed by the Faculty Advisor and Director of Graduate Studies must be filed with the Dean of the Graduate College, and a copy placed into the student's file.

Grade Requirements for Both Options: A student is expected to maintain a grade point average of B (3.0) or better throughout the course work for the M.A.T. degree. No more than 6 credit hours of course work with a grade of C may be used toward the M.A.T. requirements. Accumulation of more than 6 credit hours of graduate course work with a C grade or below will result in the termination of the student's M.A.T. program regardless of the grade point average. A terminated student may petition the Graduate College for readmission based on their individual circumstances. It would be the student's responsibility to articulate their case and explain why an exception is warranted. The minimum cumulative grade point average in graduate courses is 3.00 (=B) for graduation. Students with, or applying for, financial support must maintain a grade point average of 3.00 or better.

Seminar Requirements for Both Options: Students enrolled during summer sessions are required to enroll in Science 698, Graduate Seminar: Current Issues in Biology, for 3 credits. Alternatively, M.A.T. students enrolled during the regular academic year may fulfill the seminar requirement by enrolling for two semesters of Biology 698 on open enrollment topics. Seminars intended for students in a limited research group do not satisfy this requirement. All graduate students in the department are expected to attend all departmental seminars (no course designation).

Time Limits for Both Options (revised by the University Graduate Committee, 9/16/99):

You must complete all requirements for the M.A.T. degree within a 6-year period. If you take courses from other institutions and transfer them to your program at NAU, they must also be taken within the 6-year period.

One extension of the time to complete degree requirements (of up to one year) may be granted if there are compelling extenuating circumstances. Extensions may be granted for a variety of reasons which may include, but are not limited to, job relocation, military duty, pregnancy, illness, a serious accident, divorce, or other personal tragedies within the immediate household.

If you wish to petition for an extension of the 6-year limit, you must request an extension on the appropriate form (available from the Graduate College). Your advisor and the department chair must support your petition by signing the form.

Credit earned at Northern Arizona University at a date prior to the six-year period in which the degree is earned may be used for the degree if the student takes steps necessary to renew the credit. Credit may be renewed by attending the class for the entire semester or summer session and taking the midterm and final examinations. Forms to verify renewal of credit are available from the Graduate College.

DOCTOR OF PHILOSOPHY DEGREE (Ph.D.)

Ph.D. Program, Direct or Expedited Entry: Historically, the Department of Biological Sciences has required completion of a thesis-based master's degree as a criterion for admission to the Ph.D. program. Completion of a master's degree before a doctoral program provides the student an opportunity to demonstrate her/his abilities for graduate studies and for the faculty advisor to evaluate the same. Some faculty members will expect their students to complete a thesis-based master's degree; and some will expect a research experience equivalent to a master's thesis before she/he will support a student's entry to doctoral level studies. The "master's first" requirement was modified in Spring 1999 by the Department faculty. As stated below, a person may be considered for admission to the Ph.D. program under exceptional circumstances either at the time of admission or while in a master's degree program. **Please note the pivotal role of the faculty advisor as the initiator of a petition to the GPC.**

New Applicants: At the request of a sponsoring faculty member, a new applicant for graduate studies can be considered by the Graduate Program Committee (selection function) for direct admission to the

Ph.D. program without already having completed a thesis-based master's degree.

In-Residence Master's Students: At the request of the graduate research Faculty Advisor, a student in the master's degree program can be considered by the Graduate Program Committee for admission to the doctoral program prior to completion and successful defense of a M.S. thesis.

Each petition will be reviewed and discussed by the GPC on the full range of its individual merits, rather than in a "check-list" fashion. Some examples of the types of benchmark criteria the GPC would look for or expect may include:

- Demonstrated promise for independent research development, design, interpretation and presentation.
 - a) previous research experience as an undergraduate student or associated with post-baccalaureate work, with reference letters attesting to the applicant's abilities; and/or
 - b) research presentation(s) at regional, national or international conferences in the profession, with reference letters attesting to the applicant's abilities; and/or
 - c) co-authorship(s) of peer-reviewed publication(s), with reference letters attesting to the applicant's abilities.
- Demonstrated promise for success in graduate level course work in Biology and supporting areas germane to the student's area(s) of study.
 - a) strong undergraduate grade point average in a life science degree program and supporting science courses; and/or
 - b) strong performance on the GRE (earlier format), such as a composite score (verbal, quantitative and analytical) of 2000 or higher, and/or a composite percentile of 70% or higher.

Faculty Advisor and Graduate Committee: A Faculty Advisor for a student is selected at the time a student is admitted into the program. The student, Faculty Advisor, and the GPC participate in the process. The advisor and student then arrange a class schedule for the first semester. As indicated earlier, it is possible for the student to change advisors after consultation with the current advisor, the potential advisor, and the Director of Graduate Studies.

Prior to midterm of the first semester, a Graduate Advisory Committee must be appointed by the Graduate Dean on the basis of recommendations made by the Chair of the Department of Biological Sciences. The committee is composed of the Faculty Advisor (Chair), at least two other faculty members from the department, and one member from outside the department. Adjunct Faculty may be recommended as "outside members" of the four-member committee. A fifth member may be included if considered desirable by the student and the committee.

In the Fall 1999 semester, the Graduate Dean and Associate Dean provided the following statement on appointments for doctoral student committees:

Dissertation committees have a very important role in the life of a doctoral student. It is important that the Graduate Dean appoint the best committee possible for each of our doctoral students so the committee members can provide the appropriate guidance and mentoring for the doctoral student and his/her study. In order to appoint the best possible dissertation committee, the Graduate Dean requests that all dissertation committee recommendations include a short statement explaining the role or expertise of each member, including the outside member. A summary of the proposed study (one to three paragraphs) must accompany the recommendation.

Dissertation committees should be appointed as early as possible in the student's graduate career. In some disciplines, the committee starts to work with the student in their second or third semester. In other disciplines, it starts to function after the student passes their comprehensives. It is important to appoint the committee early so that all members can participate as fully as possible to help the student design and carry out the best possible study

A suggested format for the recommendations is provided (see APPENDIX B).

In the Spring 1999 semester, the University Graduate Committee updated its policy statement on Dissertation Committees Outside Faculty Member (see below).

University Graduate Committee Statement on Dissertation Committees:

Approved by University Graduate Committee 3/25/99.

The responsibility of a dissertation committee is to meet with the student at the earliest possible date after the committee has been appointed. The members of the committee should each be completely satisfied with the nature and scope of the problem to be studied. If some members disagree with respect to the appropriateness of the dissertation problem or its nature or scope, the committee should meet privately to iron out all differences among themselves before giving the student approval to proceed with the project. In every instance, the student's interest must be carefully preserved, so that the student does not complete his or her project as outlined by the advisor, only to find that other members of the committee are unwilling to approve it.

Dissertation Committees may include adjunct faculty members as well as members of the university faculty and may include members from outside the university.

Role of the Outside Member of Dissertation Committee:

All dissertation committees must include a faculty member from outside the department where the student is receiving his/her degree. The role of the outside member is to provide a broader perspective on the topic under study and/or to provide additional expertise on the committee. The outside faculty member should possess methodological, theoretical, or established record of publication and/or scholarship.

The purposes for including an outside faculty member on a dissertation committee include:

- a) to provide the degree candidate with a wider group of resource people for their dissertation research and writing; and
- b) to promote interdisciplinary interaction among faculty and
- c) to promote interdisciplinary aspects to work produced to fulfill "discipline-based" graduate degree requirements.

Formal Appointment of Doctoral Committee: Once the student and Faculty Advisor have decided who should be on the Graduate Advisory Committee, and the committee members have been contacted and have agreed to serve, the student must compose a letter, signed by both the student and Faculty Advisor, to the Department Chair requesting appointment of the committee. The Chair's recommendation is then forwarded to the Graduate Dean for formal appointment of the doctoral committee. In cases where a committee member will be away from campus for some time, such as sabbatical leave, a substitution for that member must be named (using the same procedure as for forming the original committee) as soon as possible after the impending absence becomes known. The Graduate Dean will NOT approve substitute committee members within two months of the dissertation defense.

For students entering the program in the fall semester, a committee meeting should be held by the end of November of this first semester in order to plan a program of courses and review a dissertation outline. For students entering in the spring semester, the meeting should be held by the end of April of this first semester.

First Committee Meeting: All students must ensure that advisory committee meetings are confirmed one month ahead of the scheduled date. Before the first meeting of the Graduate Advisory Committee, the student should complete all portions possible of the **Ph.D. Program Form, Bio Form 5** which is available in the Biology Office and website, in consultation with the Faculty Advisor. Copies should be provided to each committee member before the first meeting. The form will serve as a timetable to evaluate progress of the student toward the degree. The student's program must be approved by all members of the committee, the Director of Graduate Studies, and by the Department Chair. After the form has been signed by all responsible parties, the Biology Office will distribute one copy each to the student, Faculty Advisor, Associate Chair for Graduate Studies and the Graduate Dean; the original will be kept in the student's departmental file.

Before the student's research begins (within the first academic year or before the first research season), a Dissertation Prospectus (Research Plan) must be submitted to the advisory committee by the student. Endorsement of the dissertation prospectus (**Approval Form for Ph.D. Dissertation Prospectus, Bio Form 9**) by the Faculty Advisor and Graduate Advisory Committee eventually becomes a part of the student's advancement to candidacy.

The prospectus provides the committee with the following information:

- a) The major question(s) to be addressed
- b) The significance of the research
- c) The extent of current knowledge in the area of research
- d) The materials and methods to be used to answer the question(s)
- e) The timetable of anticipated completion of stages of the work.

Subsequent Meetings: Students will arrange a meeting of the Graduate Advisory Committee at least once per academic year in order to assess progress, discuss research results and/or future research plans. (Although one meeting per year is the minimum, it is best to keep the committee updated often on your efforts and any changing plans.) All students, after their first year in a program, must arrange for an advisory committee meeting in the fall semester. Preparation for the meeting involves a full report of the past year's research including analysis of data and a well-developed plan of research for the next year. This fall meeting would include preparation of the student's **Financial Request/Progress Report Form, Bio Form 10**. The Bio Form 10 is essential before evaluation commences for continued financial support. Students who neglect the timely completion of this annual responsibility might not be considered for continued financial support. After February 15th, a list of TA requests for continuing

students is derived from completed Form 10s.

The Progress Report includes the following information:

- a) A concise statement of the questions addressed, followed by a summary of the data and their analyses.
- b) A statement of how these data relate to the student's timetable in the Research Plan.
- c) A plan of experiments and observations for the next research period.
- d) Course work and other requirements completed. Evidence of adherence to the Ph.D. program schedule.
- e) Professional activities such as papers prepared or published, attendance at professional meetings, oral papers presented, submission of grant proposals and funding acquired, reviewing of papers, committee memberships, etc.
- f) Plan of course work and other activities to build the necessary background.

In agreement with the Graduate Advisory Committee, the Faculty Advisor will provide a written statement for the student's departmental file and for the student concerning the adequacy of progress being made. The student is responsible for the initial preparation and ultimate filing of this report. It will state clearly if satisfactory or unsatisfactory progress has been made and the basis for this conclusion. If progress is judged to be unsatisfactory, the student will be given a warning and one semester in which to improve this status. If progress remains unsatisfactory, the student will be dismissed from the degree program and any future appointment with financial support. The student has recourse to normal departmental grievance procedures (See Section on Grievance Procedures).

Course Requirements: In the Spring 1999 semester, the department faculty instituted several modifications of the Ph.D. course requirements and written comprehensives. Students admitted to the Ph.D. program under the previous handbook (prior to fall 1999) have the option to complete the requirements for Breadth and Depth courses and Written Comprehensives (writing portfolio) in effect at the time they enrolled in the Ph.D. program, or they may chose to follow the new requirements given in this Handbook.

Developing an appropriate set of courses for the student's career objective(s) rests with the Faculty Advisor, Graduate Advisory Committee and the student. To be able to comprehend, discuss and potentially teach in a variety of areas in biology, a student's breadth of knowledge in the major principles of biology should be assured by the approved course plan for the Ph.D. In addition, students identify an area of emphasis and complete courses from the NAU offerings to bolster their in-depth understanding. Typical areas of emphasis include ecology, genetics, evolution, physiology, morphology, cell biology, microbiology, etc. Graduate courses offer contemporary material from primary sources and include a rigorous writing component. The proximate goal of the doctoral course plan is to increase awareness of where resource materials of biology sub-disciplines are found and to prepare students to teach introductory courses in their area(s) of study. The ultimate goal is to expand the biological perspective of students so that they can conceptualize ideas with a broader base of knowledge and identify potential interdisciplinary research questions.

The Ph.D. in Biology degree at NAU requires a minimum total of 60 credit hours beyond the bachelor's degree, as follows. Of the 60 hours, a minimum of 15 hours must be Bio 799, Dissertation. Additional hours of Bio 799 do not count toward the minimum credit hour total of 60. The remaining 45 credit hours must be approved by the Faculty Advisor, Graduate Advisory Committee and Director of Graduate Studies. A minimum of 37 credit hours must be at the 500-/600-level and no more than 8 credits may be at the 400-level. As approved by the Faculty Advisor, Graduate Advisory Committee and Director of Graduate Studies, graduate course credits completed for a master's degree may be

applied toward the doctoral program. An approved program of study may include up to 12 combined credit hours of BIO 685 and/or 697 toward the degree requirements, as with the M.S. degree.

Courses in cognate fields such as, but not restricted to, chemistry, geology, mathematics & statistics, forestry, paleontology, computer programming, etc. may be included in the course plan. Statistics is required for analysis of data, so a minimum of Statistical Methods I and II (STA 570 and 571), or Quantitative Biology BIO 682 or equivalent is strongly recommended. The student's committee will decide whether or not to make these courses a requirement. It must be realized that when advice is needed on experimental design and/or statistical analysis, faculty in the Mathematics Department will expect, if not require, that the appropriate math courses be completed, or that current enrollment in the two-semester sequence of statistics in the Mathematics Department has been established. Additional courses in statistics are desirable, such as Multivariate Statistical Methods (STA 572) and Nonparametric Statistics (STA 472).

Seminar Requirement: The program of each doctoral student must include a minimum of three (3) Biology seminars (BIO 698). These seminars must be taken after admission to the doctoral program.

One of these seminars must cover research grant proposal preparation, i.e., the Grant Writing Seminar. As part of this seminar the student will learn how to formulate a research proposal and prepare a research proposal as part of the class requirements. The proposal must be an independent endeavor on the part of the student; it should not be jointly written with the Faculty Advisor. If the proposal involves a study closely related to what has already been written, the student must be able to demonstrate that the proposal is significantly different and innovative relative to any existing proposal.

The other two seminars may be open enrollment topics offered to all students, i.e., traditional seminar classes. Seminars intended for students in a limited research group do not satisfy this requirement.

Graduate students are expected to attend all department seminars (usually Monday afternoons at 3:30 p.m.). The exposure to a wide range of ideas and an opportunity to meet and interact with other scientists is a valuable experience for graduate students, both when the speaker is in one's own field and when she/he is not. Furthermore, all members of the department, including graduate students, have a professional responsibility to show interest in speakers whom the department has invited to present their work, and to be involved with entertaining the visitor.

Synopsis of Ph.D. Course and Credit Hour Requirements:

1. At least 15 credit hours of BIO 799, Dissertation.
2. Forty-five (45) credit hours approved by the Faculty Advisor, Graduate Advisory Committee and Director of Graduate Studies. A minimum of 37 credits must be at the 500-/600-level and no more than 8 credits may be at the 400-level. An approved program of study may include up to 12 combined credit hours of Bio 685 and/or 697 toward the degree requirements.
3. Three one-credit seminars (BIO 698) must be taken. One seminar must be Grant Proposal Writing (BIO 698). Although no credit is given, attendance at all departmental seminars is required.
4. Also note that a Ph.D. foreign language exam does not earn credit hours. (See Language Requirement section.)

Research Requirements: The Ph.D. degree requires a demonstration of considerable independence, research skill and experience in a discipline within biology. The choice of a problem and research area

is made in consultation with the Graduate Advisory Committee. Development of techniques, design of experiments, collection and analysis of data, reporting results in written and oral form, and preparation of research proposals are all skills that should be mastered in this degree program. The dissertation must demonstrate that the student has mastered his/her field of specialization, has carried out independent scholarly work, and has contributed new knowledge.

Language Requirement (and Statistics Option): Proficiency in translating one foreign language (i.e. other than English) OR proficiency in statistics as a supporting research skill, is required for the Ph.D. degree. Any language may be acceptable if deemed appropriate and approved by the Graduate Advisory Committee. Preference will be given to German, French, Russian or Spanish. With the approval of the student's Graduate Advisory Committee, the Department Chair and the Dean of the Graduate College, international students may be exempt from the foreign language requirement. The student is expected to complete the language requirement by the end of the fifth semester after admission to the Ph.D. program. To extend the period for completion of this requirement, the student must submit a written petition, signed by all members of the Graduate Advisory Committee. The petition must be submitted to the Department Chair for action well before the specified time passes. An extension only to the sixth semester will be considered.

Procedure for the Ph.D. Language Exams (effective Spring Semester 1999):

- A student will not be admitted to candidacy for the Ph.D. degree until the language requirement has been met.
- Language exams for all languages will be administered by faculty from the Department of Modern Languages three times annually – just after mid-semester in the fall and spring semesters and near the end of the summer session. Dates for each language exam will be announced by Modern Languages no later than the beginning of each semester. Contact Modern Languages for details.
- Students must register their intent to take a specific language exam by submitting a registration form to the Department of Modern Languages prior to the end of the first week of classes. This form is available from the Department of Modern Languages.
- Students will be assessed a \$25.00 fee for each administration of a language exam. This fee will be paid to the Department of Modern Languages.

The foreign language requirement may be met by successful completion of:

A) The second year sequence (e.g. German 201, 202) in the selected language at NAU (grammar and reading) with a grade of B or better. To satisfy this requirement, a student who has already taken a second year language sequence (at NAU or elsewhere) must have completed the language within three years prior to admission to the doctoral program. Formal course work in foreign language does not apply toward the required 60 credit hours beyond the bachelor's degree.

OR

B) The translation of a passage from a journal article or scholarly work as outlined below:

1. The student and advisor will select a set of journal articles or scholarly works between 75 and 150 pages from which a selection may be made for the student's examination. The Department Chair or Director of Graduate Studies will review the selection for appropriateness and will forward the material to the Chair of the Modern Languages Department. The student will be given ample time to study and read the works between the approval of their appropriateness and the test.
2. The Modern Languages Department will select a passage of 400 to 600 words from the works submitted, which the student will be expected to translate. The student may use a dictionary and/or glossary. Two (2) hours will be allowed for the test. The test will be administered by the Modern Languages Department. Students should make arrangements for the examination well in advance.

3. The Modern Languages Department will make a professional judgment regarding the proficiency shown by the student. Passing is defined as proficiency at the 2nd year (undergraduate) level. The Modern Languages Department will report the results of the examination to the Graduate College, to the student, and to the Director of Graduate Studies. The Department of Modern Languages will consider a passing grade to be 60 out of a possible 100 points.

Faculty in the Department of Modern Languages believe that the important areas for grading Ph.D. exams are grammar, meaning and vocabulary.

Grammar: Serious grammatical mistakes, like those in verb tense, negation, or noun agreement, will be penalized 3 points; smaller errors having little effect on comprehension will be penalized 1 or 2 points. (If grammatical errors distort the entire sentence, they will be counted as a ten-point penalty on Meaning).

Meaning: Failure to get the basic meaning of a sentence will result in a ten-point penalty. Minor misunderstandings will be penalized less.

Vocabulary: An incorrect word will be penalized 1 or 2 points depending on its importance in the text.

4. There is no limit on the number of times a student may take the language exam.

Note: Passing the foreign language exam does not earn credit hours toward the course work requirements for the Ph.D.

OR

C) Statistics Option: The Foreign Language Requirement may be fulfilled by a "Statistics Option" which was been recognized and approved as a significant research tool for Ph.D. students in Biology by the University Graduate Committee.

1. If the student has had one undergraduate course, then a two-course sequence at or above the 400-level is required. The courses most likely to be required would be STA 570:571 Statistical Methods I and II or equivalent. Additional courses such as STA 471 Regression Analysis, STA 472 Nonparametric Statistics, STA 572 Multivariate Statistical Methods, or BIO 682 Quantitative Biology may be recommended.

2. If the student has had modest exposure to graduate statistics, for example one graduate course, the Graduate Program Committee will require an additional course such as STA 471, STA 472, STA 571, STA 572 or BIO 682.

3. If the student has had extensive graduate training in statistics (e.g. at least two courses in statistics equivalent to STA 570:571), the Graduate Program Committee may agree that no further training is necessary and the student will have satisfied the requirement.

In any case, student and the Graduate Advisory Committee must agree on the courses to be taken during their first meeting, and be approved subsequently by the Director of Graduate Studies and the Chair of the Department.

Comprehensive Evaluations: The Written and Oral Comprehensive evaluations are designed to assess the student's breadth and depth of knowledge in biology, as well as their analytical ability, innovation, and critical reasoning skills. Upon successful completion of the Comprehensive Evaluations the students should be fully qualified to proceed into the final, intensive, research phase of their degree

program with the tools necessary to be successful in their professional activities.

On the timing of a Ph.D. student's Written Qualifying Evaluations (also known as Written Comprehensive Examinations) and the Oral Comprehensive Examination, the following process was approved by Department faculty vote on April 11, 2001:

"The Written Comprehensive Examinations (AKA, Qualifying Evaluations) have to be passed before the Oral Comprehensive Examination is convened."

Both the Written and Oral Comprehensive Evaluations must be passed to advance to Candidacy. A student who is making satisfactory progress toward the Ph.D. degree must have completed the Comprehensive Evaluations by the end of his/her fifth semester.

Written Comprehensive Evaluation (as modified and approved 4/27/99): The Written Comprehensive component will help develop (and reflect) the student's ability to research the primary scientific literature, critically review, and creatively express her/his interpretations of the subject matter. In addition, the student will reinforce skills in formulating and presenting an independent research proposal.

This requirement of the Ph.D. program is fulfilled by two components which will be reviewed and evaluated in depth by the Faculty Advisor and Graduate Advisory Committee, requiring their "passing" approval. The two components are:

1. *A "Review of the Primary Literature," of publishable quality.*
2. *A fully developed Grant Proposal (typically 10 - 12 pages of main text) in NSF or NIH format, including budget. (This Grant Proposal may be accomplished in conjunction with the Grant Writing Seminar requirement of Ph.D. students.)*

The "Review" and the "Grant Proposal" will typically be in the topic area for the dissertation research, but does not have to be. Evaluation of both components is performed by the student's Faculty Advisor and Graduate Advisory Committee in a manner similar to contemporary peer-review processes. Resubmission of a poorly written, tenuous or weak "Review" or "Grant Proposal" will be required by the Faculty Advisor and Graduate Advisory Committee, as in the "real" world. To pass the Written Comprehensive Evaluation, a student must obtain at least three-fourths of the full Graduate Advisory Committee (including Faculty Advisor) in favor of passing. If either component of the Written Comprehensive Evaluation is not passed, the student should convene her/his Graduate Advisory Committee to discuss the deficiencies and a plan for improvement. The form **Report of Results of Written Comprehensive Evaluation, Bio Form 7**, is available in the Departmental Office and website.

Oral Comprehensive Evaluation: This evaluation provides an opportunity for students to display their knowledge in biology and in research skills. The student should be evaluated on understanding of the field and ability to bring together ideas and present them cogently in a professional atmosphere. The evaluation is given by all members of the student's Graduate Advisory Committee and lasts about 3 hours. It is taken after the student has passed the Written Comprehensive Evaluation.

The Chair of the Graduate Advisory Committee (Faculty Advisor) will organize the format of and direct the evaluation. The Evaluation includes:

- a. a statement of rules governing Oral Comprehensive Evaluations and of the format to be followed;

- b. a presentation by the student (no more than 20-30 minutes) of the research grant proposal which was offered as partial fulfillment of the Written Comprehensive Evaluation (students should expect questions during the presentation);
- c. a presentation by the student (no more than 20-30 minutes) of research progress and plans (students should expect questions during the presentation);
- d. questioning related to the research;
- e. questioning on other relevant topics.

Questions frequently deal with details and concepts and principles of general biology, systematics of and literature on taxa that are the focus of the student's research, and the history, conceptual development of, and recent developments in research-related fields. When necessary, emphasis will be placed on areas in the Written Comprehensive Evaluation on which the student showed weakness.

Each member of the committee keeps notes on all questions, recording a satisfactory or unsatisfactory answer, and notes a general summary of the student's performance. A pass or fail vote is recorded by secret ballot before any discussion. To pass the Oral Comprehensive Evaluation, a student must obtain at least three-fourths of the votes in favor of passing. If the Oral Comprehensive Evaluation is failed, it may be repeated only once. A second failure will prevent admission to candidacy and continuation towards the Ph.D. degree. In order to best achieve a level of competency needed to pass this evaluation after failure on the first attempt, the student will discuss courses of action with the Graduate Advisory Committee and Faculty Advisor. Courses of action may include directed readings after consultation with faculty and/or oral presentations that emphasize learning how to think under stressful conditions, additional course work, or other specially designed studies. The form **Report of Results of Oral Comprehensive Evaluation, Bio Form 8**, is available in the Departmental Office and website.

Whatever the course of action, the student and the Graduate Advisory Committee work to achieve an expected standard for the Oral Comprehensive Evaluation. If the student failed because of a specific deficiency the committee may elect to re-examine the student within rather narrow limits.

Teaching Requirements and Paper Presentations: All students completing the Ph.D. in the Department will have gained experience in teaching. To achieve this, all Ph.D. students are required to serve as Teaching Assistants in at least one course (minimum of one laboratory section) for at least one semester. Graduate students having this experience documented at the M.S. level will have this requirement waived. In addition, all Ph.D. students must serve as a lecturer in a section of an established course. The lectures will consist of a natural unit of two to four lectures. The student must prepare and deliver the lectures in a coherent way in the presence of the course instructor. The student will then prepare a set of test questions based upon the presented material, and the student will receive student evaluations as well as a written evaluation by the course instructor. Students will not be assigned to a course unless the Department Chair and the student's Graduate Advisory Committee are convinced that they are capable of an excellent performance. The teaching requirements may be waived if English is the student's second language and if agreed upon by the Department Chair, the Director of Graduate Studies, and the Graduate Advisory Committee. The time of this teaching experience will be decided upon one year in advance so that all scheduling arrangements can be made.

All Ph.D. students are required to present scientific papers at a minimum of two meetings at the state, regional or national level.

The forms **Documentation of Teaching Experience for Ph.D. Students, Bio Form 13**, and **Documentation of Paper Presentations for Ph.D. Students, Bio Form 14**, are available in the

department office and website.

Admission to Candidacy: Admission to Candidacy means that the student becomes an official candidate for the Ph.D. degree, implying that the student is adequately prepared to undertake research independently and write a dissertation. Ordinarily, research will be well underway long before admission to candidacy is actually granted. The **Application for Candidacy for the Doctoral Degree** form is available on-line and at the Graduate College's offices, room 107 Ashurst Building. The requirements for admission to candidacy include:

- a) Confirmation of two consecutive semesters of full-time study in residence after admission to the Ph.D. program (see the Graduate Catalog Residency Requirements),
- b) Completion of the Written and Oral Comprehensive Evaluation requirements (**Bio Forms 7 & 8**).
- c) Completion of all course work on the Program of Studies (**Bio Form 5**) approved by the Faculty Advisor, Graduate Advisory Committee, the Associate Chair for Graduate Studies (plus, consideration and approval of any changes since the form was initially prepared). This includes removal of course deficiencies specified by your committee.
- d) Approval of a prospectus of the dissertation. The **Approval form for Ph.D. Dissertation Prospectus, Bio Form 9**, is available from the Departmental Office and website.
- e) Completion of the foreign language requirement or statistics option.

Admission to Candidacy should be obtained during the semester prior to graduation and must be granted at least 90 days before the Dissertation Defense Examination. (Graduate College policy.)

At this point, the committee will not suggest major alterations to the student's Research Plan, although it remains the responsibility of the committee to evaluate the quality and quantity of work the student is doing within the bounds of the Research Plan.

Dissertation Requirements:

Dissertation requirements are outlined in the Graduate Catalog (under Thesis and Dissertation Requirements). Format guidelines are located on the Graduate College home page in the section for Current Students. The Thesis and Dissertation Coordinator of the Graduate College is your source for current thesis requirements in terms of format, style, and deadlines, the "format check," bindery and microfilming requirements, and proper inclusion of a copyright notice. The Coordinator is available at the Graduate College offices in Ashurst Building. An early (and required) "format check" by the Coordinator assures that the document is being prepared such that the final copies will be acceptable to the Graduate College. The "format check" is required and can prevent lengthy and costly delays. For miscellaneous requirements regarding the dissertation, see "Instructions for Submitting Final Copies of Dissertation" at the section for Current Students of the Graduate College's website.

Two types of Dissertation formats are acceptable. The preferred form in this department includes a series of papers either submitted, or prepared for submission, to professional journals, with additional introductory and concluding chapters as described at the web site provided above. Alternatively, the Dissertation may follow a more traditional format and include general chapters for introduction, methods, results, and discussion. Specific format must be agreed upon by the student and Graduate Advisory Committee. The Dissertation must be of sufficient quality for publication in national or international journals, so a Dissertations following journal format are preferred for several reasons. This format facilitates publication of important research findings. In addition, students seeking employment or postdoctoral positions benefit greatly by the rapid publication of their dissertations. Professional publications demonstrate undeniable expertise in research and bring greater visibility to the author.

Before the dissertation is submitted to the Graduate Advisory Committee, it must have been reviewed by

the Faculty Advisor, revised by the student, and approved again by the Faculty Advisor. The initial submission of the dissertation to the Graduate Advisory Committee needs to be made well in advance of the Dissertation Defense Examination (minimum of eight weeks) in order to allow for further revisions based upon the committee members' recommendations. Committee members must provide feedback on the dissertation within two weeks if their changes are to be incorporated into the final draft of the dissertation. The dissertation, in final form, including all figures, tables, and references, must be distributed to all committee members, and a copy to the Graduate College, at least two weeks before the date of the dissertation defense examination. The "defense ready" copy for the Graduate College must be submitted with the completed and signed Oral Defense Checklist, available from the Graduate College. Any committee member who considers that the dissertation needs more work may demand a delay in the Dissertation Defense Examination.

The signed (blue ink) original plus 3 copies of the dissertation for binding are to be delivered to the Graduate College before the last day of the semester of expected graduation. To avoid having to sign up for additional credit hours after the semester in which you defend, you must submit the final approved copies of your thesis or dissertation to the Graduate College by the last day of the semester in which you complete your defense. If you do not meet this deadline, you must register for 3 hours of dissertation (799) credit each semester after your defense until you submit your final copies to the Graduate College. For more information, see the section titled Thesis and Dissertation Requirements in the Requirements for Graduate Degrees section of the Graduate Catalog.

Financial responsibility for all aspects of dissertation preparation is the student's.

Dissertation Defense Seminar: The Ph.D. degree requires that each student present a formal Dissertation Defense Seminar scheduled in the Departmental Speakers Program, and which is open to the public. Contact the faculty chair of the Speaker's Program Committee to schedule this seminar. The seminar will last 45-50 minutes with 10 or more additional minutes for questions and discussion. This seminar must be given before the student's Dissertation Defense Examination.

Oral Dissertation Defense Examination: At the start of the semester in which a student expects to defend the dissertation, she/he must verify with the Graduate College the deadline for holding a dissertation defense. No more than four years shall elapse between the Oral Comprehensive Evaluation and the Dissertation Defense Examination. If the time between examinations is longer than four years, the Oral Comprehensive Evaluation must be repeated. The dissertation defense examination may not be administered prior to 90 days after the student has been admitted to candidacy for the degree. Each student will take this examination and students are encouraged to schedule the examination immediately after the dissertation defense seminar. It is designed to test a student's competence in research, and adequacy of the dissertation; it is a rigorous "defense" of the dissertation. The examination is given by all members of the student's Graduate Advisory Committee, and typically lasts 2-3 hours (minimum is 1.5 hours, maximum 3 hours). The examination is scheduled by the student through the Graduate College at least two weeks (10 working days) in advance. The form "Oral Defense Checklist", available from the Graduate College Office, should be used for this purpose. The Oral Defense Checklist and a "defense-ready" copy of the dissertation must be in the Graduate College Office at least two weeks (10 working days) prior to the date of the defense.

In preparation for this examination, the student must consider the following points (consult the Dissertation Defense Scheduling Form, from the Graduate College):

- a) A copy of the dissertation, in final form, must be distributed to all committee members, and to the Graduate College, at least two weeks before the date of the examination.

- b) The date for the examination must be arranged by the student so that all members of the committee can attend. Such a date must fall within the Fall or Spring semesters, excluding Final Examination Week, and faculty must have a confirmed date, time, and place, in writing from the student. Notification of the scheduled examination must be given to the Graduate Dean by the Faculty Advisor at least two weeks in advance. (See sign-off of the scheduling form.)
- c) The examination should be scheduled at least 4 weeks before the date of expected graduation in order to allow for any changes to the dissertation recommended by the committee.
- d) A list of courses taken for the M.S. and Ph.D. degrees should be provided to each committee member at least 7 working days before the examination.
- e) This examination will be devoted to questions relating to the Dissertation.
- f) Any member of the faculty may attend the Dissertation Defense Examination. Graduate students may attend by invitation of the Faculty Advisor. Questions will be asked by members of the student's Graduate Advisory Committee. At the discretion of the Chair, questions may be received from the audience. Each member of the doctoral committee keeps notes on performance during the examination and records a general summary of the student's understanding of the research project and defense of the thesis. These notes will become part of the student's permanent Departmental file.

A pass or fail vote is recorded by secret ballot before any discussion. To pass, a student must obtain at least three-fourths of the votes in favor of passing. If one committee member is absent because of an emergency, permission to continue with the examination must be obtained from the Dean of the Graduate College. If permission is granted to continue with one missing member, no dissenting votes may be registered if the student is to pass. If more than one committee member is absent, the examination must be rescheduled.

The Graduate Dean also appoints an observer from the University Graduate Committee to attend the defense seminar and final oral defense. The observer reports to the Graduate Dean on the conduct of the examination. This report is also shared with the Department Chair. If invited by the Chair of the Graduate Advisory Committee, the observer may ask questions, but the observer does not vote to pass or fail the student.

If the examination is failed, it may be retaken only once.

Grade Requirements: By the end of the second semester in residence, the student must have attained, and thereafter maintain, a cumulative grade point average of 3.0 or better throughout the course work for the Ph.D. degree. No more than 6 credit hours of course work with a grade of C may be used toward the Ph.D. requirements. Accumulation of more than 6 credit hours of graduate course work with a grade of C or below will result in the termination of the student's Ph.D. program. A terminated student may petition the Graduate College for readmission based on their individual circumstances. It would be the student's responsibility to articulate their case and explain why an exception is warranted. This policy does not include grades of C obtained in the student's M.S. degree program.

Semester/Residence Requirements: After admission to the program, a minimum of two consecutive semesters of full-time study in residence are required. The Graduate College defines residency as carrying at least 9 hours during the fall or spring semesters or 5 hours during a summer session. A student can only accrue course credits counting toward the residency requirement after having been formally admitted to the degree program.

Credit Loads: The minimum full-time credit load for students on a half-time (20 hours/week) assistantship is 9 hours; the maximum load is 12 credit hours. After completion of all required course

work, exclusive of dissertation, graduate students on appointment may petition to register for 6 credit hours. Such a petition should be directed to the Graduate Dean and be endorsed by the Faculty Advisor and Department Chair. The only load for half-time faculty associates is 6 credit hours. Language courses may be counted toward these credit loads, but language credits may not be included as part of the required 60 credits beyond the bachelor's degree. Students doing research during the summer must register for at least 1 hour of thesis credit for the ten-week summer session or each of the two five-week summer sessions. A student must be enrolled for at least one (1) credit hour, preferably 3 hours, of BIO 799 in the semester or summer session when the final oral exam is taken and/or the dissertation is completed.

Application for Graduation: At the start of each academic year, the Graduate College announces its deadlines for filing the Application for Graduation. You must apply for graduation at least one semester before graduation is expected. The form and instructions are available at the Graduate College offices in Ashurst Building. The application and supporting materials require the review and signatures of the Faculty Advisor and the Director of Graduate Studies before they are forwarded to the Graduation Assistant for the Graduate College. Attach a check or receipt for the graduation fee, a current transcript (including courses for the current semester) and a copy of your approved program of studies (Bio Form 5) when you submit your application first to your Faculty Advisor.

Guidelines for Dissertation Defenses on IITV

Approved by University Graduate Committee 3/25/99.

It is most desirable for all members of the dissertation committee, the doctoral student and the University Graduate Committee representative to be present at the same location for a dissertation defense. However, given the "geographically distributed" nature of some NAU doctoral programs, it is recognized that a requirement that all participants in a defense be physically present at the same location presents a hardship for some faculty and students. Therefore, dissertation defenses may be conducted with participants at different locations linked by NAU's Interactive Instructional Television (IITV) system. These guidelines cover such defenses.

1. The decision to conduct a dissertation defense via IITV must be agreeable to the student and all members of the committee. If the student or any member of the committee is not comfortable participating in an IITV defense, all participants must be present at the same location, normally in Flagstaff.
2. There must be a minimum of two other participants in the same location as the student, normally the advisor and one other committee member.
3. All participants in the defense will be at IITV locations. Telephone participation is not acceptable. Arrangements for the IITV defense are made by the dissertation committee chair or department secretary/administrative assistant of the student's department. If there are problems with the IITV technology (e.g. the system "goes down" during the defense) the committee must wait for the problem to be resolved or reschedule the defense.
4. Any handouts prepared in advance by the doctoral candidate should be mailed to participants at other locations.
5. Voting will be by secret ballot, consistent with existing dissertation defense guidelines. The ballots will be faxed to the University Graduate Committee representative who will tally them and announce the

results.

6. A copy of the Final Doctoral Oral Examination form will be mailed to each site where participants are present. Participants at the remote site(s) will sign the original form and fax it to the University Graduate Committee representative. Participants at the site with the UGC representative will sign the faxed form and the UGC representative will submit it to the Graduate Office within 48 hours of the defense. The original form(s) from the site(s) will be mailed to the Graduate Office, where it (they) will be attached to the faxed form, thus providing original signatures from all participants.

7. The Procedures for Doctoral Oral Examinations should be followed as closely as possible.

CHECKLIST FOR Ph.D. STUDENTS IN BIOLOGY

The following checklist will aid your timely completion of program requirements. It is not meant as a substitute for the Graduate Catalog prepared by the Graduate College or for the Graduate Student Handbook (available from the Departmental Office).

___ Formalize your Graduate Advisory Committee membership; written request to the Chair of the Department, which is forwarded by Associate Chair for Graduate Studies, on your behalf, to the Graduate Dean. (See sample format, Appendix B)

___ Formalize Doctoral Degree Program plan of study (Bio Form 5) with Faculty Advisor, Graduate Advisory Committee and Director of Graduate Studies.

___ Residency requirement - two consecutive semesters of full-time study after admission to the program.

___ Seminar in Grant Proposal Writing.

___ Two, one credit seminars. Not including "research team" seminars, nor Grant Proposal Writing.

___ In addition, 45 credits of course work beyond the bachelor's degree, excluding thesis or dissertation credit. No more than eight credits may be at the 400 level. No more than 12 credits combined may be Graduate Research and/or Independent Study.

___ 15 credits of Dissertation Research (BIO 799).

___ Foreign language requirement (or Statistics option) fulfilled.

___ Written Comprehensive Evaluation (Bio Form 7).

___ Oral Comprehensive Evaluation (Bio Form 8).

___ Approved Dissertation Research Prospectus (Bio Form 9),

___ Teaching Assistant - minimum of one laboratory section for at least one semester (Bio form 13).

___ One credit of BIO 795 Internship in College in College Teaching.

___ Lecturer - Two to four lectures presented as a unit in an established course (Bio Form 13).

___ Admission to Candidacy; must have completed language requirement, etc.

___ Presentation of two papers at state, regional or national meetings (Bio Form 14).

___ Application for Graduation - should make application one semester before expected graduation.

___ Dissertation format check completed by the Format Editor of the Graduate College.

___ Dissertation in final form.

___ Dissertation seminar presented to Department & public in conjunction with the oral defense.

___ Oral Dissertation Defense Examination.

___ Dissertation revisions made.

___ Final dissertation copies submitted to the Graduate College with binding and microfilming fees paid.

LEAVE OF ABSENCE POLICY FOR GRADUATE STUDENTS

Approved by University Graduate Committee 3/25/99

Graduate students in degree programs that require continuous registration may be granted a Leave of Absence for up to one academic year by the Graduate Dean, upon the recommendation of the student's advisor and department graduate coordinator. A leave will be granted under conditions requiring the suspension of activities associated with the thesis/dissertation or coursework. A leave will be granted for extraordinary reasons only, such as health or medical problems, or military duty. Normally, time-to-degree requirements are not suspended during a Leave of Absence. (If an extension of time to degree is needed, it should be requested in the request for leave of absence.) The right to use University facilities and/or faculty time is suspended during a Leave of Absence. No form of graduate assistant support will be provided during the Leave of Absence.

International students (students attending NAU on an F-1 or J-1 visa) are generally not eligible for a leave of absence due to INS regulations. Contact the International Student Adviser for any exceptional circumstances.

Leave of Absence requests must be filed no later than the last day for adding classes during the semester in which the leave is to start, and cannot be granted retroactively. Students on an approved Leave of Absence will not be required to apply for readmission. Students who are absent beyond the end of an approved Leave of Absence will be required to apply for readmission as a graduate student and to the appropriate academic department. A Leave of Absence will be extended beyond one year only under exceptional circumstances. Such an extension must be requested on the Leave of Absence form.

A Leave of Absence form will be developed by the Graduate College and will include the following:

- Student name, student ID number, local address and phone, address and phone during proposed leave.
- Statement of request for leave and justification by student.

Semester leave begins and semester of student's return to program.

- Approval by advisor, department graduate coordinator and graduate office.

FINANCIAL AID

Although it is the goal of the Department to provide financial support for all students admitted into the graduate program, it is recognized that certain students may have their own means of support, and that many worthwhile research projects do not have large resource requirements. When the above conditions can be demonstrated (as determined by the Graduate Program Committee and approved by the Department Chair), the student will be considered for admission into our graduate program on an equal basis with those who would receive institutional support. Admission to the graduate program in biology without support does not imply that financial support will necessarily be provided in the future. Such students would be considered on an equal basis along with all new applicants. Evaluation for continued financial support is a part of the yearly progress meetings and is based on previously established criteria outlined in pertinent sections above and on the **Financial Request/Progress Report Form, Bio Form 10**. To be considered for continued support, the student must complete the Financial Request/Progress Report Form by February 15th.

The Graduate Program Committee evaluates applicants and makes recommendations for the various types of financial aid to the Department Chair who then makes a formal Departmental recommendation to the Graduate Dean. The Graduate Dean certifies the official appointments.

The Graduate College publishes a comprehensive "Graduate Assistant Handbook," which provides more policy and procedural details than appear here. A copy can be obtained at the Graduate College's offices in Ashurst Building or online at the Graduate College web site.

Teaching Assistantships:

Teaching Assistantships are available to graduate students in the Biology Graduate Program. These TAs include an out-of-state Tuition Scholarship, partial coverage of in-state tuition plus health insurance. A minimum semester and cumulative grade point average of 3.0, plus satisfactory progress in your degree program are required for continued support.

Teaching assistants are expected to devote 20 hours per week to their appointment, including teaching, office hours, preparations, testing and grading, set-up and take-down of laboratories, and should expect to have 12 contact hours of teaching per week. They must have an excellent command of spoken English and of the relevant subject matter. Teaching Assistants must enroll in BIO 795, Internship in College Teaching (1 credit hour), in their first semester of the assistantship. This credit may count toward the required credit hours for the M.S., M.A.T. and Ph.D. degrees. Teaching assistants must carry a course load of 9-12 hours per semester to qualify as full-time students. All teaching assistants must attend the University Graduate Assistant Orientation each Fall prior to the start of classes.

Guidelines are provided to Teaching Assistants every Fall concerning the policies and expectations as determined by the Department and the Graduate College. See the "Graduate Assistants Handbook." Teaching Assistants play a substantial role in the training of undergraduates, and this responsibility is not to be viewed lightly by the Teaching Assistant. For this reason:

1. Teaching Assistants are expected to be in residence and available for assignment throughout the dates specified in their contract, beginning with the first and continuing through the last day of their contract.
2. The Graduate College provides a mandatory workshop each Fall for the purpose of familiarizing the Teaching Assistants with the goals of the University and the Assistant's role in achieving these goals.
3. Course coordinators will hold regular meetings with their Assistants. These meetings deal with organizational details, various aspects of good teaching techniques and course content, including the preparation and grading of assignments and examinations. Attendance at these meetings is mandatory.
4. Course coordinators will evaluate all Teaching Assistants through no less than two classroom visitations. A standardized evaluation form, Bio Form 12, Faculty Evaluation of Graduate Assistants Form (available in the Biology Office) is used to report the results of these evaluations. Each semester an evaluation will be placed in the Teaching Assistant's individual file, and a copy given to the Teaching Assistant.

Research Assistantships, Externally Funded Research Grants:

A variable number of research assistantships are available from research funds granted to the university and under the direction of individual faculty members. Recommendations for these appointments are made by the faculty members who administer these funds. Inquiries about availability should be made to the faculty doing research in the area in which the student is interested. These RAs normally include an out-of-state Tuition Scholarship, partial coverage of in-state tuition plus health insurance. These appointments have a commitment of 20 hours per week during the academic year. A course load of 9-12 credit hours per semester is required for full-time status. A minimum semester and cumulative grade point average of 3.0, plus satisfactory progress in your degree program are required for continued support.

Research Assistantships, Faculty Intramural Grant Program:

Several Research Assistantships, funded through the NAU Intramural Grant Program, are usually available each year to individual faculty. Assistantships are awarded to faculty based on merit in a campus-wide competition. Only full-time students already in a degree program are selected for these assistantships.

A commitment of 20 hours per week is required during the academic year. The distribution of effort within these 20 hours is determined by the faculty member awarded the grant. These RAs include an out-of-state Tuition Scholarship, partial coverage of in-state tuition plus health insurance. To maintain full-time status, a course load of 9-12 credit hours per semester is required. A minimum semester and cumulative grade point average of 3.0, plus satisfactory progress in your degree program are required for continued support.

Summer Enrollment and FICA Rules (from the Graduate College):

All graduate assistants working during summer months **MUST** be enrolled for at least one (1) credit hour during the term of employment. This means one credit hour each in 5- week Summer Sessions I and II OR one credit hour in the 10-week Summer Session. Graduate assistants no longer have a 20-hour maximum work limit during the summer months.

To be exempt from paying FICA tax on university paid summer salaries, graduate students need to be enrolled at least half-time – meaning two (2) credit hours (per each 5-week Summer Session I and II OR for the 10-week Summer Session) and regularly attending classes. There is no longer a work limit on student employees for this exemption. When graduate assistants are not in compliance with this exemption rule, both the student and the department (i.e. the summer funding source) **each become liable for the FICA tax of 7.65% on the student's gross earnings!** The tax to the employer is equal to the amount of tax paid by the employee. The employees' share of FICA charges for students paid from grants and local accounts will be charged to the grant or local account. For current policies and any questions, contact the administrative assistant for fiscal matters of the Graduate College.

Faculty Associates:

When funding is available, two half-time appointments may be available for Ph.D. students who have completed all requirements except the dissertation and who have previous teaching experience plus an excellent command of spoken English. Teaching responsibilities usually involve 6 - 12 contact hours per week, including lecturing. In addition, Faculty Associates are expected to perform all the activities normally associated with responsibility for university courses, such as holding office hours, tracking student progress, writing and grading exams, maintaining records and assigning final grades. Out-of-state Tuition Scholarships are provided to Faculty Associates, who are also eligible to apply for a Tuition Scholarship, which includes an in-state tuition waiver.

Faculty Associates must carry a course load of 6 credit hours per semester to be considered full time students. These positions are designed to support the best possible teachers from students in the Ph.D. program, preferably after they have submitted papers for publication derived from their dissertation. Applicants for these positions should realize that much preparation time is required for teaching so that progress toward the Ph.D. becomes much more difficult. Faculty Associate positions are normally awarded for no more than one academic year.

Technicianships:

When funding is available, two technicianships are available to assist in the maintenance of the Deaver Herbarium and Teaching/Research Animal Collection. These are 9-month academic year appointments with an out-of-state tuition waiver. These positions have a commitment of 20 hours per week, including serving as a teaching assistant in one laboratory section. A course load of 9-12 credit hours per semester is required for full-time status. A minimum semester and cumulative grade point average of 3.0, plus satisfactory progress in your degree program are required for continued support.

Fellowships:

The availability of Fellowships (e.g. ARCS awards, PEO awards, etc.) varies from year to year. As the department is notified of these, they will be announced via the department's weekly e-mail newsletter, *UPDATE*. The Associate Chair for Graduate Studies and the Office of the Vice Provost for Research and Graduate Dean are also starting points for general information on Fellowships.

Tuition Scholarships:

Several in-state and out-of-state Tuition Scholarships are available each year from the Graduate Dean's Office. These Scholarships are awarded by the Graduate Dean upon the recommendation of the Department Chair in consultation with the Associate Chair for Graduate Studies. Decisions are based upon the relative financial need and academic performance of the students. By Regents' policy, only Arizona Residents are eligible for an in-state tuition scholarship via this source. Those wishing to apply for a Tuition Scholarship should obtain the Graduate Scholarship Request Form located in the "Publications and Forms" section of the Graduate College website. Students who will be applying for this type of support should also indicate this on the annual Financial Application/Progress Report Form (Bio Form 10).

Duration of Support: Graduate students in a master's program may receive two full academic years (four semesters) of support, regardless of its source, as long as they are making satisfactory progress toward completion of their degree requirements. Satisfactory progress is evaluated by the student's Graduate Advisory Committee and the Graduate Program Committee. In unusual cases the Graduate Dean may allow an extension. For such an extension, the student must be in good standing and any delay in the completion of the degree must be due to circumstances beyond the control of the student. The student petitions the Department before the Department allocates its assistantships. The department forwards the petition to the Graduate College with its recommendation.

A graduate student who has completed a Master's degree with two years of support and is then admitted into the Ph.D. degree program may receive additional years of support. There is no firm limit on total years of support for a student in a doctoral program, however, up to four years is typical. The department carefully considers each student's progress before recommending an extension of support beyond four academic years in the doctoral program.

Only students who perform their duties well and make good progress in their program will be considered for continued support after their first year in a program. Policies of the Graduate College are provided in the "Graduate Assistant Handbook."

Students will be notified by March 15 if support will not be renewed in the following Fall semester.

EVALUATION OF TAs, RAs, TECHNICIANS AND FACULTY ASSOCIATES

Teaching Assistants are evaluated each semester by course coordinators or other faculty involved in the course. A standardized form for evaluation, Bio Form 12, Faculty Evaluation of Graduate Assistants Form, is available in the Department office. These completed forms are submitted to the Director of Graduate Studies, and the student's advisor, and placed in the student's file.

Research Assistants are evaluated by their research supervisor, typically their Faculty Advisor. A summary of the student's progress and the Major Advisor's assessment of such progress is included in the Financial Request/Progress Report Form, Bio Form 10, which is completed each year before February 15th, and placed in the student's Departmental file.

Departmental technicians are evaluated once each year by their immediate supervisor. A letter of evaluation from the student's supervisor is placed in the student's Departmental file, and a copy given to the student, before February 15th of each year.

Faculty Associates are evaluated each semester. Evaluations by students are conducted according to the standardized procedures of the College. Faculty Associates are also evaluated by an appropriate regular faculty member, either the student's Faculty Advisor, or the faculty member directly responsible for a given course being taught by the Faculty Associate. This evaluation is in the form of a letter and is based upon at least two classroom visits per semester. The letter is placed in the student's Departmental file, and a copy is given to the student and the Associate Chair for Graduate Studies.

STUDENT'S ROLE IN THE DEPARTMENT

The Department provides students with professional training for professional life in teaching, research, and service. Students acquire these skills through interactions with faculty in formal courses, seminars (BIO 698), completion of thesis and dissertation research, publishing in the best possible scientific journals, service on faculty committees, attendance at departmental seminars, attendance and presentation of papers at scientific meetings, and interactions with visiting scientists. Evaluation concerning a student's leadership qualities and professional capabilities will often rely on the student's participation in these diverse activities. Such qualities may be reflected in letters of recommendation composed for students.

The Chair and the Faculty of the Department value the contributions that graduate students make toward the operation of the Department. The graduate student performs an important role in the Department by providing suggestions concerning all phases of departmental operations. A professional relationship between faculty and graduate students is encouraged at all times. Students may also contribute by inviting visiting scholars and helping to entertain them during discussions, at mealtimes and in receptions.

Students carry significant responsibilities in Departmental teaching, research, service and mentoring undergraduates. Some are employees of the Department, University, and State, and all are representatives of the Department on campus, at other institutions, and at professional meetings. Therefore, graduate students are expected to exhibit high professional standards, to be knowledgeable about departmental affairs, faculty and student activities, and in general to conduct themselves in a professional manner. Implicit in admission to the Graduate Program is the expectation that graduate students will develop and demonstrate a strong sense of professionalism and academic integrity. The faculty-graduate student relationship is unique in the academic environment and it must not be compromised by unprofessional conduct.

Success in science requires tremendous dedication to research. The competition for jobs is extreme and is based largely on the quality of independent research and the dedication perceived by those professors most closely associated with a graduate student.

A graduate student's research sponsor also has a responsibility to the University and often to a funding agency. University time and grant funds are expected to lead to the steady accumulation of relevant and reproducible data. Graduate student research is often, therefore, both an essential part of the student's education as well as part of the research sponsor's and the University's obligation to the larger scientific community.

Biology Graduate Student Association: BGSA is formally recognized by the Associated Students of Northern Arizona University (ASNAU), the University administration, the Department Chair, and the Department Faculty as an official body through which graduate students in the Department may express opinions and convey suggestions to the Faculty. The President or other elected official of BGSA will approach the Associate Chair for Graduate Studies with student concerns, and work to effect positive change through consultation with the Department Chair, the Faculty, and the Graduate Dean, if so suggested by the Associate Chair for Graduate Studies. If BGSA's elected representative is so advised by the Department Chair, concerns will be presented to the faculty at faculty meetings. A BGSA representative will be permitted to attend all Faculty meetings except at the discretion of the Department Chair when unsuitable topics such as personnel matters are to be discussed. All students are encouraged to attend general meetings of the BGSA because issues affecting graduate students are discussed and votes taken on these issues. A BGSA representative will be elected to serve on certain departmental committees. One student may be elected to any committee the Faculty deems appropriate. Faculty Chairs on these committees will notify the BGSA representative concerning meeting times, dates, and the agenda for the meetings.

Graduate Student Awards:

Beginning in 1999, graduate students' achievements became recognized by two new annual awards presented as part of University Honors Week. In 2000 the number of awards within the department grew to five. Descriptions of each award, details on the nomination process, eligibility, etc. will be provided each spring. Recognition includes a cash award, certificate and the recipients' names engraved on plaques permanently displayed in the department lobby.

The five awards are:

- James R. Wick Outstanding Teaching Assistant Award.
- Emeritus Faculty Award for Graduate Student Contributions.
- Outstanding Graduate Student Paper Award.
- Graduate Alumni Award for Outstanding Master's Thesis.
- Graduate Alumni Award for Outstanding Doctoral Dissertation.

EXPECTATIONS AND RESPONSIBILITIES OF TEACHING ASSISTANTS, FACULTY ASSOCIATES, AND FACULTY IN THE DEPARTMENT OF BIOLOGICAL SCIENCES

Teachers in general have long adhered to a sound and honorable set of ethical standards and these traditional standards continue to apply in today's world. In an effort to circumvent any misconceptions or misunderstandings about what is expected of us, it is appropriate to state formally these basic principles that have been informally incorporated in the academic way of life for so long.

Above all, a single factor binds us together: we are professional biologists. This fact transcends individual differences in interests, expertise, degrees, or experience, and forms the basis for expectations and responsibilities related to our position in the Department.

As professionals, we have a special obligation to encourage the free pursuit of learning in students, to preserve intellectual freedom, to practice intellectual honesty, to respect the rights, the dignity and cultural backgrounds of others, to acknowledge the right of all to express differing opinions in a responsible manner, to promote conditions that foster the free exchange of ideas, and to maintain the orderly processes that make freedom of inquiry and instruction possible.

As teachers, we represent the University, the Department and the profession. As such we must hold before students, as best we can, the scholarly standards of our discipline. We must make every reasonable effort to foster honest academic conduct and to assure that our evaluation of students reflects the students' true merit. We must recognize that students are individuals and are entitled to an atmosphere conducive to learning and to fair treatment in all respects of the teacher-student relationship. It is important to present a professional image in the classroom and in other interactions with students and colleagues. This includes proper attire, personal cleanliness, and basic common courtesies. In all contact with students we should use socially acceptable behavior and language. E.g., under no circumstance should teachers participate in activities that might be construed as a conflict of interest such as dating a student enrolled in their lecture or laboratory course, or who is under their supervision. By adhering to the above standards of professional conduct we will be in a sound position to carry out our responsibilities for the health and well-being of the Department.

GRIEVANCE PROCEDURES

Students with significant complaints on any aspect of their training in the department should address such complaints directly to the person causing the grievance, in order to reach a settlement. If such an approach fails to achieve the desired results, the student's Faculty Advisor should be consulted and should attempt an agreeable settlement. If the grievance is not resolved at this point the student should take it to the Department Chair. When none of the above attempts are successful, an ad hoc Grievance Committee will be appointed by the Chair of the Department. If the grievance is not against the student's advisor, the advisor will chair the committee. Two additional members will be selected by the student, and two members will be selected by the Chair of the Department. The Chair of the Department will replace the student's advisor if the advisor is the apparent cause of the grievance. After deliberating on the grievance, the committee will notify the student orally and in writing of its decision to either accept the grievance, and to correct the matter, or to find the grievance unfounded. Should the student remain unsatisfied with a decision at the Departmental level, following appeals are to be directed to the Dean of the Graduate College.

Grade appeals will be treated as described by policies and procedures in the most recent edition of the NAU Student Handbook.

POLICY AND FUNDING CHANGES

Changes relating to student support or policies beyond the control of the Department and University can occur. Under these circumstances the Department cannot be held legally responsible for any difficulties a student incurs.

Northern Arizona University does not discriminate on the basis of age, sex, race, religion, color, national origin, disability or veteran status in admissions, employment, and educational programs or activities which it operates as required by Title IX of the Education Amendments of 1972, Title VI and Title VII of the Civil Rights Act of 1964 as amended; Section 504 of the Rehabilitation Act of 1973 as amended; the Civil Rights Act of 1991; the Americans with Disabilities Act of 1990; and the Age Discrimination in Employment Act of 1967. NAU's policy on nondiscrimination is further augmented by the voluntary affirmative action policies of Executive Order 11246, Section 503 of the Rehabilitation Act of 1973, and the Vietnam Era Veteran's Readjustment Assistance Act of 1973 as amended. You may inquire about the application of these regulations or the NAU Safe Working and Learning Environment Policy by contacting the Affirmative Action Office.

FACULTY OF THE DEPARTMENT OF BIOLOGICAL SCIENCES

Allison Adams, Ph.D., Assistant Professor, University of Michigan, 1984 *Cell biology/ cancer biology*

Gery Allan, Ph.D., Assistant Research Professor, Claremont Graduate School, 1998 *Molecular Phylogenetics of Plants*

Sylvester Allred, Ph.D., Senior Lecturer, Northern Arizona University, 1989
Ecology; the world's expert on Abert's squirrel ecology

Tina Ayers, Ph.D., Associate Professor, University of Texas, Austin, 1986
Plant Systematics

Russell P. Balda, Ph.D., Emeritus Regents' Professor, University of Illinois, 1967
Avian Ecology and Behavior

James C. Baldi, Ph.D. Assistant Professor, Ohio State University 1995, *Exercise Physiology*

Stephen Beckstrom-Sternberg, Ph.D., Associate Professor, Claremont Graduate School, 1988
Bioinformatics

Dean W. Blinn, Ph.D., Emeritus Regents' Professor, University of British Columbia, 1969
Phycology and Aquatic Ecology

J. Richard Coast, Ph. D., The University of Tennessee, Knoxville, 1983.
Exercise Physiology, Respiratory Physiology

Neil Cobb, Ph.D., Assistant Research Professor, Northern Arizona University, 1993 *Plant-Herbivore Interactions, Stress Ecology, Arthropod Biodiversity, Ecological Remote Sensing*

Lee C. Drickamer, Ph.D., Regents' Professor, Michigan State University, 1970 *Chemical Signaling of Animal Behavior*

Cheryl A. Dyer, Ph.D., Associate Research Professor, University of California-San Diego, 1986

Physiology of Steroids, Endocrinology

Pauline Entin, Ph. D., Associate Professor of Exercise Science, Cornell University 1997, *Comparative physiology of exercise*

Catherine Gehring, Ph.D., Associate Professor, Northern Arizona University, 1991 *Plant - Mycorrhizal - Herbivore Ecology*

Julie Gess-Newsome, Ph.D., J. Lawrence Walkup Distinguished Professor, Oregon State University, 1992 *Science education, teacher cognition, curriculum and instruction, professional development*

Alice Gibb, Ph.D., Associate Professor, University of California-Irvine, 1997 *Comparative Physiology and Functional Morphology*

Patrick Hannon, Ed. D., Assistant Professor, University of Northern Colorado, 1980 *Exercise science*

Steven Hempleman, Ph.D., Professor, University of California-Davis, 1982 *Comparative Neural and Respiratory Physiology*

Richard G. Holloway, Ph.D., Visiting Assistant Professor, Texas A&M University, 1981 *Palynology / Paleoecology / Plant Anatomy*

Laura F. Huenneke, Ph.D., Professor, Dean of Engineering and Natural Sciences, Cornell University, 1983 *Ecology*

Bruce Hungate, Ph.D., Associate Professor, University of California - Berkeley, 1995 *Ecosystem Ecology, Soil Nitrogen Cycling*

Nancy C. Johnson, Ph.D., Associate Professor, University of Minnesota, 1991 *Mycorrhizal and Soil Ecology*

Michael Kearsley, Ph.D., Research Associate, Northern Arizona University, 1991 *Community Ecology and Biostatistics*

Paul Keim, Ph.D., Regents' Professor, E. Raymond and Ruth Reed Cowden Endowed Chair in Microbiology, University of Kansas, 1981 *Molecular Genetics of Microbes, Plants and Animals*

George Koch, Ph.D., Professor, Stanford University, 1988 *Plant Ecophysiology*

Jeffery Leid, Ph.D., Assistant Professor, Montana State University, 2000 *Medical Microbiology*

Stan L. Lindstedt, Ph.D., Regents' Professor, University of Arizona, 1977 *Comparative and Environmental Physiology*

Ronald A. Markle, Ph.D., Professor and Associate Chair for Graduate Studies, The Pennsylvania State University, 1976 *Mammalian/Human Physiology*

Jane Marks, Ph.D., Associate Research Professor, University of California-Berkeley, 1995 *Aquatic ecology*

Loretta P. Mayer, Ph. D., Assistant Research Professor, Northern Arizona University, 2000
Reproductive endocrinology and biotechnology development.

Fernando Monroy, Ph.D., Associate Professor, University of Queensland, Australia, 1988
Microbiology and immunology

W. Linn Montgomery, Ph.D., Professor, Arizona State University, 1979
Physiology and Ecology of Fishes

Kiisa Nishikawa, Ph.D., Regents' Professor, University of North Carolina, 1985
Ecology, Evolution and Neural Control of Behavior in Amphibians

T. Lon Owen, Ph.D., Professor, University of California-Davis, 1972
Anatomy & Physiology, Thermoregulation, AP Biology Training

David Pierotti, Ph.D., Associate Professor and Associate Chair for Administration, University of California-Los Angeles, 1992 *Physiology of Muscle and Locomotion, Comparative Physiology*

Peggy Pollak, Ph.D., Senior Lecturer, Northern Arizona University, 1989
Plant Reproductive Development

Richard Posner, Ph. D., Professor, Cornell University, 1990 *Theoretical Biology and Biophysics*

Peter W. Price, Ph.D., Emeritus Regents' Professor, Cornell University, 1970
Ecology of Insects, General Ecology

Catherine R. Propper, Ph.D., Professor, Oregon State University, 1989
Endocrinology of Water Balance and Reproduction in Amphibians and Reptiles

Randall Scott, Ph.D., Lecturer, University of Texas, Austin, 1986
Plant Systematics, Phylogeny

Egbert Schwartz, Ph.D., Assistant Professor, University of California - Davis, 1999 *Environmental Microbiology*

Philip Service, Ph.D., Professor, University of North Carolina, 1982
Population and Evolutionary Genetics

Richard Shand, Ph.D., Professor, University of California-Davis, 1986 *Microbial Genetics of Extreme Halophilic Archaeobacteria and Microbiology*

Stephen Shuster, Ph.D., Professor, University of California-Berkeley, 1987 *Invertebrate Zoology, Evolution of Animal Mating Systems*

Constantine Slobodchikoff, Ph.D., Professor, University of California-Berkeley, 1971
Behavioral Ecology, Communication and Social Behavior in Prairie dogs.

Stefan Sommer, Ph.D., Assistant Research Professor, University of New Mexico, 1993 *Community*

Ecology, Development of Science Education Materials

Tad Theimer, Ph.D., Associate Professor, Northern Arizona University, 1991
Vertebrate Zoology, Wildlife, Conservation Biology, Tropical Rain-Forest Ecology

Catherine Ueckert, Ph.D., Associate Professor, University of Nebraska-Lincoln, 1994 *Biology Education, Curriculum and Instruction, Science Education Standards*

David Wagner, Ph. D., Assistant Professor, Northern Arizona University, 2002 *Wildlife Ecology*

Mary Elizabeth Watwood, Ph.D., Professor and Chair of the Department, University of Georgia, 1987
Environmental Microbiology, Bioremediation, Wetland Ecology

Stephen Warburton, Ph.D., Associate Professor, Brown University, 1991 *Developmental Physiology*

Amy V. Whipple, Ph.D., Research Assistant Professor, University of California – Davis, 1996
Evolutionary Ecology

Karen Van Winkle-Swift, Ph.D., Regents' Professor, Duke University, 1976
Genetic and Ultrastructural Analysis of Development in Microbes

Thomas G. Whitham, Ph.D., Regents' Professor, University of Utah, 1978
Plant and Insect Ecology

In addition, the department's professional expertise is enriched by a host of Postdoctoral Researchers and Research Staff who, if willing, may be proposed for service on Graduate Advisory Committees.

APPENDIX A**List of Graduate Program Forms and Sources.**

NOTE: The department forms listed below are available in the department office and website.

- BIO FORM 1* *Application for Admission: M.S. and Ph.D. Programs – discontinued. See Graduate College application*
- BIO FORM 2* *Application for Admission: M.A.T. Program – discontinued degree program.*
- BIO FORM 3 Master of Science Program Plan (copy required for Application For Graduation)
- BIO FORM 4* *M.A.T. Program Form – discontinued program.*
- BIO FORM 5 Ph.D. Program Plan (copy required for Application For Graduation)
- BIO FORM 6 Report on Results of Final Oral Examination for Master's Degree
- BIO FORM 7 Report on Results of Written Comprehensive Evaluation
- BIO FORM 8 Report on Results of Oral Comprehensive Evaluation
- BIO FORM 9 Approval Form for Ph.D. Dissertation Prospectus
- BIO FORM 10 Financial Request/Progress Report Form
- BIO FORM 11 Report on Results of Final Oral Examination for Ph.D. Degree
- BIO FORM 12 Evaluation of Teaching Assistants and Faculty Associates
- BIO FORM 13 Documentation of Teaching Experience for Ph.D. Students
- BIO FORM 14 Documentation of Paper Presentations for Ph.D. Students

**The forms listed below are obtained at the Graduate College or on-line at: www.nau.edu/gradcol
READ & follow the instructions that accompany these – to minimize delays.**

- Online Application for Graduate Admission (**fee**).
- Checklist for Master's Students in Thesis Programs.
- Petition for Transfer Credit (Master's degree program only).
- Checklist for Doctoral Students.
- Master's Thesis and Doctoral Dissertation guidelines, bindery and microfilming requirements (**fees**).
- Application for Candidacy for the Doctoral Degree (multiple attachments with this)
- Dissertation Defense Scheduling Form Checklist (defense ready copy of dissertation)
- Application for Graduation (**fee** plus there are multiple attachments to include).
- Petition for Extension of Time Limit (six years for master's candidates, including time in non-degree status)
- Request for Change of Graduate Program of Major.
- Leave of Absence.
- Tuition Scholarship

The following form is obtained from the Department of Modern Languages:

- Ph.D. Language Exam Application (**fee**).

APPENDIX B
Request for appointment of Ph. D. Dissertation Committee

To: William Grabe,
 Interim Dean of the Graduate College

From:

Re: Recommended Dissertation Committee Members

Student Name: _____ Program: Ph. D. in Biology

Dissertation Draft Title or Topic: _____

(Attach a 1 – 3 paragraph summary of the proposed dissertation topic.)

List committee members and describe area(s) of expertise for each member. If outside committee member is not of the NAU faculty, attach a current copy of their curriculum vita.

Dissertation Chair: _____

Committee Member: _____

Committee Member: _____

Committee Member Outside Department: _____

Dissertation Chair Signature: _____ Date: _____

Associate Chair for
 Graduate Studies: _____ Date: _____