

**Graduate Student Handbook for the Department of
Biological Sciences, Texas Tech University**

Revised December 2020

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GENERAL REQUIREMENTS OF THE GRADUATE PROGRAM DEPARTMENT OF BIOLOGICAL SCIENCES TEXAS TECH UNIVERSITY

Revised December 2020

See also **Frequently Asked Questions** at end of handbook

The Department of Biological Sciences has six graduate degree programs: the **Non-Thesis-Master's degree programs in Biology and in Microbiology** designed to make a substantial contribution to the intellectual development of students who are not interested in pursuing a research-oriented career in science; the **Thesis-Master's degree programs in Biology and in Microbiology** designed for students who want to pursue a career in science, including research, teaching and/or health sciences; and the **Doctoral degree program in Biology** designed to prepare students for research-oriented scientific careers in academia, industry, and management. Finally, the department supports the **Professional Science Master's (PSM)** program. Specific requirements for each of these degree programs are different and are discussed in other portions of this document. The first part of this document outlines issues relevant to all of the programs listed above.

Course and Credit-Hour Requirements

Students working on **Master's degrees** are required to take at least **30 credit-hours** beyond the Bachelor's degree. Students working on **Doctoral degrees** are required to take at least **72 credit-hours** beyond the Bachelor's degree. Details regarding the number of research hours that can be counted towards the degree are addressed in the respective sections of the Handbook. While the exact classes required for the degree are determined by the student's **Advisory Committee**, the following two courses are required of all graduate students unless granted an exemption by the course Instructor of Record, Department Chair and Graduate Advisor.

BIOL 6301 – Advanced Topics in Biology - Biology Pedagogy must be completed by all graduate students in their first year that wish to be considered for a teaching assistantship. Ph.D. students – also see the section under Doctor of Philosophy in Biology.

BIOL 6202 Preparation for Graduate Learning and Teaching in Biology must be completed during the first fall semester in the program. Ph.D. students – also see the section under Doctor of Philosophy in Biology.

All Thesis-based or Doctoral students must take the appropriate courses listed below.

BIOL 6000/MBIO 6000 (Master's Thesis) or BIOL 8000 (Doctor's dissertation) – at least 6 credit-hours for a Master's, or 12 hours for a Ph.D. of the relevant course is required

BIOL 7000 (Research) – With ongoing efforts to finish graduate degrees within a reasonable time period (see below and sections on Master's and PhD degrees for details) and prevent students from accumulating too many credit hours (99 for PhD, 40 for Master's), unless there are exceptional circumstances, PhD students should keep the number of BIOL 7000 hours below **25** and Master's students should keep the number hours below **14**. Non-thesis Master's students may take up to **6** hours of BIOL 7000.

Leveling courses. Incoming graduate students with educational gaps in their background may be required by their Advisors or **Advisory Committee** to take courses to fill these gaps. These gaps will be identified during the initial **Advisory Committee** meeting (in the first semester of enrollment). Leveling courses cannot be counted towards the graduate degree being sought.

Languages and research tools. The Department of Biological Sciences **does not** require for a foreign language or a research tool subject (for example, computer programming) for the graduate degree.

Grades of "D" or "F" in any graduate course cannot be applied to the Degree Plan. Students may retake these courses to fulfill requirements on the degree plan, but the original D/F grade is retained in calculating their GPA.

Enrollment

All graduate students are required to register for appropriate courses in **every** fall, spring, and summer semester in which they expect to receive financial assistance (RA-ship, TA-ship, GA-ship, see below).

Students are expected to register for a number of course hours commensurate with the anticipated level of effort in their graduate studies. Except in unusual circumstances, all students who are pursuing graduate degrees will be enrolled full-time.

- For students in the Non-Thesis degree programs, full-time enrollment is normally 12 credit-hours in a regular semester and 6 hours in the summer session; this allows degree completion within one calendar year. However, if the student does not plan on finishing within one year, the number of hours can be reduced.

- For students conducting research, or who are on fellowships, assistantships, or other appointments that require duties other than course work, full-time enrollment is normally **9 credit-hours** in a regular semester and **3 hours** in the summer session (summer 1 or summer 2) for which they receive support (i.e., 21 hours per calendar year).

Time to Degree Completion and Maximum Allowable Graduate Credit Hours

- The maximum time allowed for completing a Master's degree is **six years**; the Ph.D. must be completed in **eight years** (or four years after the Qualifying Examination).
- Graduate students who are not making timely progress toward completion of their degree are subject to termination by the Dean of the Graduate School.

Non-traditional Students

- The department welcomes non-traditional students who may be pursuing a graduate degree in addition to their regular employment
- Continuous enrollment for these students is 3 credits/semester
- Time to completion is 6 years for Master's, 12 years for Ph.D.
- Regular limits for support
- Lay out expectations for 'timely progress toward completion'
- Staff members or other TTU employees in graduate school?

Academic Standing

- Good standing requires the following conditions are met:
 - The student is on track with required paperwork relative to their time in degree (see provided checklist)
 - The student has maintained the **required GPA of 3.0**. While "C"s count towards the degree, if students receive a grade of "C" **in six hours or more** of any courses taken to satisfy the degree plan, they will cease to remain in good standing.
 - The student is making adequate progress towards their degree
 - The student has consistently fulfilled any previous TA/RA/GA jobs
 - The student has provided proof of English Proficiency (International Students)

Departmental Support

- Departmental support is provided to our graduate students through Teaching Assistantships (TA-ships), Research Assistantships (RA-ships) and General

Assistantships (GA-ships). The duties and benefits of each differ, and the student is expected to be aware of the specific requirements and policies that govern each.

- In order to qualify for departmentally funded TA, RA, or GA, the graduate student **must be in good academic standing**. For students in good academic standing, the Department will provide at least 3 or 5 years of support (Fall and Spring Semesters) for students enrolled in the Thesis-Master's and Doctoral degrees, respectively. Summer support during this period is not guaranteed. Doctoral students will receive an additional \$1000 per year upon achieving candidacy starting with the next semester after passing the Qualifying Examination. This will continue up until the 5 year time limit for guaranteed support.
 - Additional TA or GA support may be provided to meet departmental teaching need
 - Additional RA support may be provided through grant or fellowship funding awarded to the student directly or to their advisor
 - If the previous two points do not apply, students in need of departmental support in excess of the time limits must be approved by the GSAC.

Departmental Graduate Student Meeting

Sometime during the **week before classes begin** in the fall semester, the Chairperson of the Department and other faculty will meet with the graduate students to communicate important news and information. Attendance at this meeting is **mandatory** for all students. In addition, course coordinators often hold organizational meetings with Teaching Assistants during this same week that a certain lab is being presented.

Advisory Committee

All students must form an **Advisory Committee no later than the end of first year** of enrollment in the Thesis-Master's or Ph.D. degree programs.

The **Advisory Committee** is Chaired by the **Major Advisor** and consists of at least **three** Graduate Faculty (Master's) or **five** (Doctoral) faculty members (including the **Major Advisor** in each case). The **Major Advisor** and a majority of the committee must be Graduate faculty from Biological Sciences (Adjunct Faculty approved by the Graduate School can serve as members or Co-Chairs). If a proposed member of the **Advisory Committee** is at an institution other than Texas Tech University or the TTU Health Sciences Center, the Graduate School must be provided with his or her curriculum vitae (CV). In general, the person's academic credentials should be equivalent to those of a Graduate Faculty member at Texas Tech University. A majority vote by the committee is needed to pass Qualifying and oral exams and dissertation defenses.

During the first two semesters, the **Advisory Committee** will work with the student to come up with a **Degree Plan** (see below) which outlines the courses the student will be required to complete and include any leveling courses. This Degree Plan **must** be filed with the Department and the Graduate School by the end of the first year.

The **Advisory Committee** will meet with the student **at least once a year** to advise the student and assess his or her progress towards their degree.

The Non-Thesis M.S. students will only meet with their **Advisory Committee** twice, first to approve the degree plan, and then when either the comprehensive oral exam is administered or the capstone presentation is made. Additional details are addressed in section of the Handbook dealing specifically with the Non-Thesis M.S.

The **Advisory Committee** for students completing a thesis-based M.S. or Ph.D. degree will also set any comprehensive or oral examination requirements.

Changes in the Advisory Committee

Occasionally, it may become necessary for a student to change the composition of his or her **Advisory Committee**.

- A student changing his or her **Major Advisor** should inform the current **Major Advisor** directly, or through the GSAC or Departmental Chair.
 - In the case where the Current **Major Advisor** is leaving DBS, another member of the student's **Advisory Committee** is usually appointed as new lead advisor.
 - If a change in **Major Advisor** is desired by the student for reasons that cannot be resolved through consultation with the GSAC or Department Chair, another **Major Advisor** will be appointed. Unless there has been a significant shift in research direction, the new main advisor will preferably come from the current committee.
- In the case of a proposed change other than the **Major Advisor**, the process can be initiated by the **Major Advisor** or student. Professional courtesy requires that the committee member being replaced be informed about plans for change and reasons for the decision.
- If a degree plan has been filed prior to any of the above changes in the composition of the **Advisory Committee**, a "Title or Committee Change Form" must be completed, signed by the Department's Graduate Advisor (Chair of the Graduate Student Affairs Committee), and submitted to the Graduate School.

The Degree Plan

All Master's and Doctoral students must submit a "**Degree Plan Program**" to the Graduate School **no later than end of their second semester in the program**. This form is available in the Graduate School in the Raiderlink portal (Raiderlink.ttu.edu). The form lists all required courses for degree completion as agreed to by the student and his/her Advisor (for Non-Thesis M.S.) or **Advisory Committee** (for thesis-based M.S. and Ph.D.).

All courses (regardless of prefix) that are required to complete the **M.S. or Ph.D.** degree should be listed under the Major's column. In the case of individual study courses or those that can be repeated for additional credit (e.g., BIOL 6100, BIOL 6101, BIOL 6301, and BIOL 6309), specific titles should also be listed.

As noted above minimum of **30 credit hours** of course work for Master's students and **72 credit hours** for Doctoral students must be listed on the degree plan. Undergraduate courses cannot be counted toward any graduate degree. Graduate courses (up to 12 hours) taken as an undergraduate may be counted towards the graduate degree, unless needed for the undergraduate degree.

Tool, Language, or Leveling courses are listed only if required by the Advisor or **Advisory Committee**. They normally do not count toward the graduate degree unless indicated by the **Advisory Committee**.

The completed form should be initialed (not signed) by **Major Advisor** and then submitted to the Departmental Graduate Advisor for review and approval. The GSAC will forward an approved Degree Plan to the Graduate School, and a copy will be retained in departmental files. The student should also keep a copy.

Transfer Credit

If the student wishes to receive transfer credit for graduate courses taken at another institution, the course prefixes and numbers on the student's transcript from that institution must be listed as well as the equivalent graduate courses at Texas Tech University. The student should be prepared to provide the Graduate Advisor and the Graduate School with copies of the transcript. Up to six hours of course credit can be transferred. Such courses are approved by the Graduate School after submission of the Degree Plan.

Annual Accomplishments Report

Once each year (usually in April), all graduate students will enter their accomplishments (posters, papers, awards, etc.) via a provided paper/online form, which will be signed off by their **Major Advisor** and provided to the GSAC and DBS Graduate Secretary. A copy will be emailed to the student for their records.

Admission to Candidacy

Every applicant for a graduate degree is required to make formal application for admission to candidacy.

- For master's students, admission to candidacy is combined with the Degree Plan. The required form (Program for the Master's degree and admission to Candidacy) can be filed after at least 9 credit-hours of classwork (excluding leveling courses), have been completed.
- For the Doctoral students, the Degree Plan is separate from the Application for Candidacy. Candidacy cannot be requested until after the student has satisfactorily passed the Qualifying Exam (for details, see Ph.D. section of the handbook). Upon receipt of a recommendation from the student's **Advisory Committee** (form to be completed by the **Major Advisor** and submitted to the Graduate School), the request

will be reviewed by the Graduate Dean and Council. A student must be admitted to candidacy for the doctorate at least one year prior to the proposed graduation date.

- The Graduate Catalog should be consulted for any additional requirements that must be met before Admission to Candidacy is granted for each of the respective degrees. Subsequent changes in the degree plan must also be approved and filed with the Graduate School.

Final Oral Examination or Capstone Presentation

Non-Thesis Programs

Before earning the M.S. degree in one of the **Non-Thesis Programs**, each student must make either a capstone presentation or pass a final examination in the major field. Details are presented in the section on Non-Thesis-Master's degree. The results of the examination must be reported to the Graduate School approximately four weeks prior to graduation (consult the "Graduation Deadlines" posted on the Graduate School web site for the exact date), and the examination should be scheduled with this deadline in mind. Students should also understand that faculty members may not be available for an examination during the summer.

Thesis Program M.S. and Dissertation Program Ph.D.

For the **Thesis-Master's** and **Doctoral** degrees, a final oral examination is administered by the student's **Advisory Committee** and is an examination based on the student's thesis research. The students will submit their thesis at least 1 month prior to the examination. The Committee members will use a question-and-answer format to assess the extent of the student's knowledge and understanding of the basic scientific principles he or she has been exposed to through their research, thesis work, course work, and readings. The student is expected to deliver responses that are concise and well-reasoned. As soon as possible after the examination, the **Major Advisor** will report the results to the Dean of the Graduate School. Students should be cognizant of Graduate School deadlines. Additional details of each exam and the expectations are presented in the sections dealing with Thesis M.S. and Doctoral degrees, respectively.

Intent to Graduate

During the semester of intended graduation, a "Statement of intention to graduate" must be filed at the Graduate School, and payment of all required fees must be posted to the student's University bill. Since exact dates for these requirements vary with the semester, the current "Graduation Deadlines" posted on the Graduate School website should be consulted.

Academic Probation, Suspension, and Dismissal

The Graduate School sets the policies that govern probation, suspension, and dismissal based on the student's current and cumulative GPA, timely progress, and completion of required courses or exams. Graduate students should ensure that they are familiar with these policies.

- Students whose cumulative GPA falls below 3.0 are placed on academic probation
- In the subsequent semester, if the student's GPA is above 3.0, but the cumulative GPA remains below 3.0, the student is placed on continuing probation
- Students who fail to raise their cumulative GPA above 3.0 by the end of the 2nd long semester following initial probation, are placed on Academic Suspension
- Students on Academic Suspension are required to remain out of the graduate school for one term, and must reapply for admission (See OP 64.07)
- Readmission is not guaranteed
- Students placed on Academic Suspension twice will be dismissed from the graduate school
- Other causes for probation, suspension, and dismissal from the program include continued failure to make good progress towards the degree, failure to complete required leveling courses in a timely fashion, and repeated failure to pass qualifying examinations

Termination Policy

If students fail to perform to the required research standards or progress towards their degree, advisors will use the following process:

For egregious errors or problems (severe safety violations, plagiarism, gross non-performance, sexual assault, etc.), the student may be terminated outright. The **Major Advisor** will notify the Graduate Student **Advisory Committee** (GSAC) and Department Chair. The student may appeal to the GSAC, which will investigate and work with the **Major Advisor** to come to a resolution.

For moderate problems, the **Major Advisor** will submit a report to the student, GSAC and chair, detailing the problems. Student and advisor will agree on a plan forward, mediated by GSAC or chair as needed and supplied to the department. In the next semester, the plan will be re-evaluated for student progress, and student either terminated, continue probation, or the problem resolved. Probation for any particular set of problems continuing for more than 3 semesters will yield termination.

The **Major Advisor** may resign from the student's committee. In this case, the student needs to identify another DBS faculty member willing to serve as the committee chair. If none can be found, the student will be terminated.

Failure to pass qualifying/comprehensive exams or defense may also be grounds for termination, as described in those sections.

In extreme cases of disagreement, the student and the faculty member both have the right to file an official grievance, according to normal grievance policies of the University (O.P. 64.07)

TA Evaluation

Each semester, course instructor will evaluate their TAs on a 50-point scale according to the following rubric: A good TA doing a good job should earn a 30. Any score >39 or <20 should be justified by comments detailing concrete examples of either exceptional behavior (>39) or problematic behavior (<20). See below for a sample rubric.

Sample Rubric:

45-50: Exceptional TA, perfect, as detailed in your thorough comments.

40-44: Excellent TA, went well above and beyond the call of duty, as detailed in your comments.

35-39: A great TA who did a great job. You would fight other faculty to have this TA again.

32-34: A good TA who did a great job or a great TA who did a good job. "A+."

29-31: A good TA who did a good job. This should be the mode of all TA scores. "A."

26-28: A TA who did an adequate job. A little below departmental standards, but still acceptable. "B."

20-25: A TA who did the bare minimum, or lacked needed experience to TA the course, or had other problems. Improvement in teaching is needed. "C."

10-19: Terrible TA. Many failures and problems which are detailed in comments. "D/F."

0-9: Horrible TA. Failed to perform expected job duties. Should never have a TAship again. "F-"

Students scoring <20 more than 2 times will no longer be eligible for a TAship. For any score >39 or <20, the Associate Chair, Chair or GSAC will review the instructor comments and student evaluations. They will either agree with the instructor score or readjust the score to reflect the comments and evaluations. Both instructor and student evaluations will be stored to track teaching/progress, qualifications for teaching awards, and TA assignment. TAs will receive this feedback. Students with TA scores under 25 will be given lower priority for TAships. To control for overly exuberant or critical faculty, these scores may be percentiled at the Chair's discretion.

All TA's who are responsible for assigning grades to students in an undergraduate lab section must submit an approved syllabus through Digital Measures (DM) according to House Bill 2504. DM can be accessed at the Biology website under Resources.

In addition, all Graduate Students must take the training for Responsible-Academic-Conduct during their first semester at TTU. Failure to do so can result in blocking of TAships and/or even graduation. Follow the link below to take the one-time training:

<https://www.depts.ttu.edu/gradschool/training/responsible-academic-conduct-training.php>

PROFESSIONAL SCIENCE MASTER'S PROGRAM IN ENVIRONMENTAL SUSTAINABILITY

DEPARTMENT OF BIOLOGICAL SCIENCES, TEXAS TECH UNIVERSITY

Revised December 2020

The Professional Science Master's (PSM) degree program in Environmental Sustainability is recommended for many students interested in entering the workforce as mid-level managers in Environmental Sustainability positions in National and Multinational Companies, City and Local governments and non-profit organizations. Additional formal course work helps bolster knowledge and learning and may enhance employability. The student must complete at least **30 hours** of subject related course credit beyond the Bachelor's degree including 15 credits of required courses including the 3 credit internship (240 clock hours), and 15 credit hours of interdisciplinary electives. Additional coursework in Professional Skills (credit or non-credit) is required. In lieu of a thesis, a portfolio of student's coursework and internship report are presented for defense.

Admission to the PSM Degree Program

Applications for admission into the PSM degree program in Biology may be considered and acted upon by the department's Graduate Student Selection Committee (GSSC) or chair's designee for Non-Thesis program. Currently, decisions to admit students are based upon:

- (1) the grade point average (GPA) over the last **60 hours** of undergraduate course work (for applicants who have or are about to receive a Bachelor's degree);
- (2) **two** letters of recommendation from academic contacts;
- (3) in the case of **international students** for whom English is a second language, the scores for the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS); and
- (4) a Cover Letter introducing the application and explaining how the PSM degree will help the student attain their career goals.

In contrast to thesis degrees, PSM students are assigned a **Major Advisor** prior to admission. The chair's designee for the PSM program will initially serve as **Major Advisor**, though the designee may pair them with a different faculty **Major Advisor**.

Advisory Committee

As soon as possible, but **no later than the end of the first semester** of enrollment in the Master's degree program, the student will form an **Advisory Committee** in consultation with his or her **Major Advisor**. This Committee is composed of **three** Graduate Faculty members, one of

them being the **Major Advisor** who will serve as the Chairperson of the Committee. At least **two-thirds** of the Committee members (including the Chairperson) must be Graduate Faculty members in the Department of Biological Sciences (this may include Adjunct Faculty). The remaining committee member will be the PSM advisor or designee from the Natural Resource Management PSM track.

As soon as the student has filed the “Program for the Master’s Degree and Admission to Candidacy” form (see the “Degree Plan” section of this handbook), the Dean of the Graduate School will officially appoint the **Advisory Committee**. It is the responsibility of the student and **Major Advisor** to inform the Graduate Advisor and the Dean of the Graduate School of any changes in the composition of the **Advisory Committee**.

Occasionally, it may become necessary for a student to change the composition of his or her **Advisory Committee**. Changes should follow the procedure outlined in the general guidelines in the Graduate Handbook.

Degree Plan

All Master’s students must submit a “Program for the Master’s Degree and Admission to Candidacy” form to the Graduate School. This form, which must be signed by the Graduate Advisor, lists all required courses. It should be submitted as soon as possible but **no later than the second semester** of enrollment in the Master’s degree program. The Graduate Catalog should be consulted for any additional requirements that must be met before Admission to Candidacy is granted. Subsequent changes in the degree plan must also be approved by the **Advisory Committee** and filed with the Graduate School.

All requested information must be filled in on the form, including expected graduation date (month and year), and all members of the **Advisory Committee**.

Students are expected to register for a number of course hours commensurate with the anticipated level of effort in their graduate studies. Except for non-traditional students, or in unusual circumstances, all students who are seriously pursuing graduate degrees will be enrolled full time. Full-time enrollment is normally **12 hours** in a regular semester and 3 hours in the summer session. For students on fellowships, Teaching or Research Assistantships, or other appointments that require duties other than course work and research, full-time enrollment is normally 9 hours in a regular semester and 3 hours in each summer session (i.e., 24 hours per calendar year).

Course Requirements

The student and **Advisory Committee** together will determine which courses must be taken to satisfy the PSM degree requirements. The student is required to complete at least **30 credit hours** beyond the Bachelor’s degree. No more than **6 hours** may be research (BIOL 7000 Research).

Required courses include 15 credits from the following courses:

BIOL 5309 Leveling Advanced Ecology

BIOL 6360 Environmental Sustainability

NRM 5320 Natural Resource Biopolitics

NRM 5312 Ecology of Renewable Natural Resources

BIOL 5000 Professional Internship

Elective courses of 15 credits from related courses chosen by the student in consultation with the advisor including related courses from other university departments.

Professional Plus courses can be completed by completion of the Business Essentials Graduate Certificate from the Rawls School of Business, 4 professional skills related courses approved by the advisor from across university departments, or a not credit program through the university Skillsoft modules specified by the advisor and equal to 12 credit contact hours.

TA Support

PSM students are NOT typically supported by TAs during the long semesters or summers. However, in the event that the department needs additional TAs, students may have the option to be supported by a TA. Students receiving more than 6 semesters of support have lower priority for TAs and may not be guaranteed TA support.

Graduation: Additional Requirements

During the semester of intended graduation, a “Statement of Intention to Graduate” must be filed at the Graduate School, and payment of all required fees must be posted to the student’s University bill. Since exact dates for these requirements vary with the semester, the current “Graduation Deadlines” posted on the Graduate School web site should be consulted.

Final Oral Examination/ Capstone Activity

Completion of a PSM degree requires an internship and presentation of a PSM program portfolio. Traditionally, this is a ~2 hour oral presentation and defense of the portfolio administered to the student by the **Advisory Committee** in the student’s final semester. The content of the defense broadly covers the internship report and the student’s coursework. Satisfactory performance by the student is indicated by a majority affirmative vote of the Committee members.

Deadlines and Time Limit

Although every effort will be made by both the Graduate Advisor and the **Major Advisor** to make the student aware of various University and Department regulations and deadlines, it is ultimately the student’s responsibility to see that these regulations are adhered to and that the deadlines are met (see the accompanying checklist). All course work applied towards a PSM degree must be completed within **six calendar years** after admission into the graduate program. Non-traditional students needing an exception to this time limit will send a letter to the GSAC or chair detailing the need for an exception.

PSM IN BIOLOGY CHECKLIST

Students are responsible for seeing that all deadlines are met.

Item	Date or Deadline
Plan courses for first semester	Week before classes begin
Set up and meet with Advisory Committee	During first semester of enrollment
File degree plan (“Program for the Master’s Degree and Admission to Candidacy” form) at the Graduate School: at least 30 hours of graduate course work, no more than 6 hours of BIOL 7000 (must also file any subsequent course changes)	After first Advisory meeting, but no later than the end of the second semester of enrollment
File internship agreement form with Advisor	Due semester prior to start of internship but no earlier than upon completion of 75% of degree coursework.
Internship	During the final semester
File “ Statement of Intention to Graduate ” at the Graduate School	During the semester of graduation (exact deadline varies)
Graduation	Target: 1-2 years

NON-THESIS-MASTER'S PROGRAM IN BIOLOGY
DEPARTMENT OF BIOLOGICAL SCIENCES, TEXAS TECH UNIVERSITY
Revised December 2020

The Non-Thesis-Master's degree program in Biology is recommended for many students interested in improving their credentials to pursue advanced degrees or careers in science, including research, teaching, and medicine. Additional formal course work helps bolster knowledge and learning and may enhance employability. The student must complete at least **30 hours** of course credit beyond the Bachelor's degree. Generally, students will select a curriculum at the start in consultation with their advisor, and it will have no more than 6 hours of BIOL 7000 (Research). Students interested in research-intensive Master's degree should pursue the Thesis-Master's program instead.

Admission to the Non-Thesis-Master's Degree Program

Applications for admission into the Non-Thesis-Master's degree programs in Biology may be considered and acted upon by the department's Graduate Student Selection Committee (GSSC) or chair's designee for Non-Thesis program. Currently, decisions to admit students are based upon:

- (5) the grade point average (GPA) over the last **60 hours** of undergraduate course work (for applicants who have or are about to receive a Bachelor's degree);
- (6) **two** letters of recommendation from academic contacts;
- (7) in the case of **international students** for whom English is a second language, the scores for the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS); and
- (8) a Cover Letter introducing the application and explaining how the Non-Thesis-Master's degree will help the student attain their career goals.

In contrast to thesis degrees, Non-Thesis students are not required to choose a **Major Advisor** prior to admission. The chair's designee for the Non-Thesis program will initially serve as **Major Advisor**, though the designee may pair them with a different faculty **Major Advisor**.

Advisory Committee

As soon as possible, but **no later than the end of the first semester** of enrollment in the Master's degree program, the student will form an **Advisory Committee** in consultation with his or her **Major Advisor**. This Committee is composed of **three** Graduate Faculty members, one of them being the **Major Advisor** who will serve as the Chairperson of the Committee. At least

two-thirds of the Committee members (including the Chairperson) must be Graduate Faculty members in the Department of Biological Sciences (this may include Adjunct Faculty). As soon as the student has filed the “Program for the Master’s Degree and Admission to Candidacy” form (see the “Degree Plan” section of this handbook), the Dean of the Graduate School will officially appoint the **Advisory Committee**. It is the responsibility of the student and **Major Advisor** to inform the Graduate Advisor and the Dean of the Graduate School of any changes in the composition of the **Advisory Committee**.

The **Advisory Committee** will typically meet with the student **twice**: first to approve the course curriculum for the Non-Thesis-Master's degree, and a second time to conduct the final oral examination. This second meeting may be waived if the student completes a different capstone activity at the **Major Advisor**’s discretion.

Occasionally, it may become necessary for a student to change the composition of his or her **Advisory Committee**. Changes should follow the procedure outlined in the general guidelines in the Graduate Handbook.

Degree Plan

All Master’s students must submit a “Program for the Master’s Degree and Admission to Candidacy” form to the Graduate School. This form, which must be signed by the Graduate Advisor, lists all required courses. It should be submitted as soon as possible but **no later than the second semester** of enrollment in the Master’s degree program. The Graduate Catalog should be consulted for any additional requirements that must be met before Admission to Candidacy is granted. Subsequent changes in the degree plan must also be approved by the **Advisory Committee** and filed with the Graduate School.

All requested information must be filled in on the form, including expected graduation date (month and year), and all members of the **Advisory Committee**. If a proposed member of the Committee is at an institution other than Texas Tech University or the TTU Health Sciences Center, the Graduate School must be provided with his or her curriculum vitae. In general, the person’s academic credentials should be equivalent to those of a Graduate Faculty member at Texas Tech University.

Students are expected to register for a number of course hours commensurate with the anticipated level of effort in their graduate studies. Except for non-traditional students, or in unusual circumstances, all students who are seriously pursuing graduate degrees will be enrolled full time. Full-time enrollment is normally **12 hours** in a regular semester and 3 hours in the summer session. For students on fellowships, Teaching or Research Assistantships, or other appointments that require duties other than course work and research, full-time enrollment is normally 9 hours in a regular semester and 3 hours in each summer session (i.e., 24 hours per calendar year).

Course Requirements

The student and **Advisory Committee** together will determine which courses must be taken to satisfy the M.S. degree requirements. The student is required to complete at least **30 credit hours** beyond the Bachelor's degree. No more than **6 hours** may be research (BIOL 7000 Research).

The student and his or her **Advisory Committee** will decide together what courses are listed on the degree plan. Under the Major column, list all of the courses that are taken to complete the M.S. degree requirements in the major subject area. All graduate (5000 and 6000)-level courses with BIOL, BOT, MBIO, and ZOOL prefixes are considered as major courses. Formal courses are listed only by prefix and number without a title, e.g., BIOL 5320. For individual study courses or courses that can be repeated for additional credit (e.g., BIOL 6100, BIOL 6101, BIOL 6301, and BIOL 6309), different sections or specific titles should also be listed to indicate that the course does not have the same content each time it is taken. Up to **6 credit hours** of BIOL 7000 Research can be included on the Non-Thesis M.S. degree plan. If the student desires, two or three courses in a subject area outside of the major can be designated as a minor and listed under the Minor column. However, this is entirely optional. A minimum of **30 credit hours** of course work must be listed on the degree plan. Undergraduate courses cannot be counted toward the Master's degree. Tool, Language, or Leveling courses are listed **only** if required by the **Advisory Committee**. The student's **Major Advisor** should communicate to the Graduate Advisor that the plan has been approved by the **Advisory Committee**. The Degree Plan is then uploaded to the Graduate School by the Graduate Administrative Assistant.

TA Support

Non-Thesis-Master's students are NOT typically supported by TAs during the long semesters or summers. However, in the event that the department needs additional TAs, students may have the option to be supported by a TAsip. Students receiving more than 6 semesters of support have lower priority for TAsips and may not be guaranteed TA support.

Graduation: Additional Requirements

During the semester of intended graduation, a "Statement of Intention to Graduate" must be filed at the Graduate School, and payment of all required fees must be posted to the student's University bill. Since exact dates for these requirements vary with the semester, the current "Graduation Deadlines" posted on the Graduate School web site should be consulted.

Final Oral Examination/ Capstone Activity

Completion of a Non-Thesis M.S. degree requires a capstone activity. Traditionally, this is a ~2 hour oral exam administered to the student by the **Advisory Committee** in the student's final semester. The content of the exam broadly covers the material learned in the student's coursework. Satisfactory performance by the student is indicated by a majority affirmative vote of the Committee members.

Alternatively (at the **Major Advisor**'s discretion), a capstone activity or course may be substituted for the final oral examination. Successful completion of the capstone activity or course (Grade of B- or higher) will complete the Non-Thesis-Master's degree.

A student who fails the capstone activity or exam may repeat it once in the following semester. In the event of failure, the **Major Advisor** will provide the student with a written summary of the perceived deficiencies and corrective actions that need to be taken before making the second attempt. As soon as possible after the examination, the **Major Advisor** will report the results to the Dean of the Graduate School.

Deadlines and Time Limit

Although every effort will be made by both the Graduate Advisor and the **Major Advisor** to make the student aware of various University and Department regulations and deadlines, it is ultimately the student's responsibility to see that these regulations are adhered to and that the deadlines are met (see the accompanying checklist). All course work applied towards a Non-Thesis-Master's degree must be completed within **six calendar years** after admission into the graduate program. Non-traditional students needing an exception to this time limit will send a letter to the GSAC or chair detailing the need for an exception.

Switch to Thesis-Master's or Ph.D.

In some circumstances, a student may desire to engage more fully in research. A change from a Non-Thesis to a Thesis-Master's degree will require a letter from the student's **Major Advisor**, agreeing to serve as the student's **Major Advisor** for a thesis, outlining the student's suitability for research, and how the student will complete the needed research within a reasonable time frame. This request will be considered by the GSAC. For a change to a Ph.D., students are expected to first complete their Non-Thesis-Master's degree and then apply to the Ph.D. program.

NON-THESIS M.S. IN BIOLOGY CHECKLIST

Students are responsible for seeing that all deadlines are met.

Item	Date or Deadline
Annual departmental graduate student meeting	Week before classes begin in the fall semester
Plan courses for first semester	Week before classes begin
Set up and meet with Advisory Committee	During first semester of enrollment
File degree plan (“Program for the Master’s Degree and Admission to Candidacy” form) at the Graduate School: at least 30 hours of graduate course work, no more than 6 hours of BIOL 7000 (must also file any subsequent course changes)	After first committee meeting, but no later than the end of the second semester of enrollment
Turn in annual graduate student evaluation form	Usually due in March or April of each year
File “ Statement of Intention to Graduate ” at the Graduate School	During the semester of graduation (exact deadline varies)
Capstone Activity/Course or Schedule Final Oral Examination	During the final semester
Graduation	Target: 1-2 years

NON-THESIS-MASTER'S PROGRAM IN MICROBIOLOGY
DEPARTMENT OF BIOLOGICAL SCIENCES TEXAS TECH UNIVERSITY

Revised December 2020

The Non-Thesis-Master's degree program in Microbiology is recommended for many students interested in improving their credentials to pursue advanced degrees or careers in science, including research, teaching, and medicine. Additional formal course work helps bolster critical thinking, knowledge and learning, and may enhance employability. The student must complete at least **30 hours** of course credit beyond the Bachelor's degree. Generally, students will select a curriculum at the start in consultation with their advisor, and it will have no more than 6 hours of BIOL 7000 (Research). Students interested in research-intensive Master's degree should pursue the Thesis-Master's program instead.

Admission to the Non-Thesis-Master's Degree Program

Applications for admission into the Non-Thesis-Master's degree programs in Microbiology, may be considered and acted upon by the department's Graduate Student Selection Committee (GSSC) or chair's designee for Non-Thesis program. Currently, decisions to admit students are based upon:

- (1) the grade point average (GPA) over the last **60 hours** of undergraduate course work (for applicants who have or are about to receive a Bachelor's degree);
- (2) **two** letters of recommendation from academic contacts;
- (3) in the case of **international students** for whom English is a second language, the scores for the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS); and
- (4) a Cover Letter introducing the application and explaining how the Non-Thesis-Master's degree will help the student attain their career goals.

In contrast to thesis degrees, Non-Thesis students are not required to choose a **Major Advisor** prior to admission. The chair's designee for the Non-Thesis program will initially serve as **Major Advisor**, though the designee may pair them with a different faculty **Major Advisor**.

Advisory Committee

As soon as possible, but **no later than the end of the first semester** of enrollment in the Master's degree program, the student will form an **Advisory Committee** in consultation with his or her **Major Advisor**. This Committee is composed of **three** Graduate Faculty members, one of them being the **Major Advisor** who will serve as the Chairperson of the Committee. At least **two-thirds** of the Committee members (including the Chairperson) must be Graduate Faculty members in the Department of Biological Sciences (this may include Adjunct Faculty). As soon as the student has filed the "Program for the Master's Degree and Admission to Candidacy" form

(see the “Degree Plan” section of this handbook), the Dean of the Graduate School will officially appoint the **Advisory Committee**. It is the responsibility of the student and **Major Advisor** to inform the Graduate Advisor and the Dean of the Graduate School of any changes in the composition of the **Advisory Committee**.

The **Advisory Committee** will typically meet with the student **twice**: first to approve the course curriculum for the Non-Thesis-Master's degree, and a second time to conduct the final oral examination. This second meeting may be waived if the student completes a different capstone activity at the **Major Advisor**'s discretion.

Occasionally, it may become necessary for a student to change the composition of his or her **Advisory Committee**. Changes should follow the procedure outlined in the general guidelines in the Graduate Handbook.

Degree Plan

All Master's students must submit a “Program for the Master's Degree and Admission to Candidacy” form to the Graduate School. This form, which must be signed by the Graduate Advisor, lists all required courses. It should be submitted as soon as possible but **no later than the second semester** of enrollment in the Master's degree program. The Graduate Catalog should be consulted for any additional requirements that must be met before Admission to Candidacy is granted. Subsequent changes in the degree plan must also be approved by the **Advisory Committee** and filed with the Graduate School.

All requested information must be filled in on the form, including expected graduation date (month and year), and all members of the **Advisory Committee**. If a proposed member of the Committee is at an institution other than Texas Tech University or the TTU Health Sciences Center, the Graduate School must be provided with his or her curriculum vitae. In general, the person's academic credentials should be equivalent to those of a Graduate Faculty member at Texas Tech University.

Students are expected to register for a number of course hours commensurate with the anticipated level of effort in their graduate studies. Except for non-traditional students, or in unusual circumstances, all students who are seriously pursuing graduate degrees will be enrolled full time. Full-time enrollment is normally **12 hours** in a regular semester and 6 hours in the summer session to complete the degree in 1 year. For students on fellowships, Teaching or Research Assistantships, or other appointments that require duties other than course work and research, full-time enrollment is normally 9 hours in a regular semester and 3 hours in each summer session (i.e., 24 hours per calendar year).

Course Requirements

The student and **Advisory Committee** together will determine which elective courses must be taken to satisfy the M.S. degree requirements. The student is required to complete at least **30 credit hours** beyond the Bachelor's degree. No more than **6 hours** may be research (BIOL 7000

Research). The curriculum is listed at the end of this document. Deviation from the curriculum needs to be approved by the **Advisory Committee**. The student must fill out the degree plan, in consultation with the **Major Advisor**. Under the Major column, list all of the courses that are taken to complete the M.S. degree requirements in the major subject area. Major courses are listed in the curriculum at the end of this document. Formal courses are listed only by prefix and number without a title, e.g., BIOL 5320. For individual study courses or courses that can be repeated for additional credit (e.g., BIOL 6100, BIOL 6101, BIOL 6301, and BIOL 6309), different sections or specific titles should also be listed to indicate that the course does not have the same content each time it is taken. Up to **6 credit hours** of BIOL 7000 Research can be included on the Non-Thesis M.S. degree plan. If the student desires, two or three courses in a subject area outside of the major can be designated as a minor and listed under the Minor column. However, this is entirely optional. A minimum of **30 credit hours** of course work must be listed on the degree plan. Undergraduate courses cannot be counted toward the Master's degree. Tool, Language, or Leveling courses are listed **only** if required by the **Advisory Committee**. The student's **Major Advisor** should communicate to the Graduate Advisor that the plan has been approved by the **Advisory Committee**. The Degree Plan is then uploaded to the Graduate School by the Graduate Administrative Assistant.

TA Support

Non-Thesis-Master's students are NOT typically supported by TAs during the long semesters or summers. However, in the event that the department needs additional TAs, students may have the option to be supported by a TAsip. Students receiving more than 6 semesters of support have lower priority for TAsips and may not be guaranteed TA support.

Graduation: Additional Requirements

During the semester of intended graduation, a "Statement of Intention to Graduate" must be filed at the Graduate School, and payment of all required fees must be posted to the student's University bill. Since exact dates for these requirements vary with the semester, the current "Graduation Deadlines" posted on the Graduate School web site should be consulted.

Final Oral Examination/ Capstone Activity

Completion of a Non-Thesis M.S. degree requires a capstone activity. Traditionally, this is a ~2 hour oral exam administered to the student by the **Advisory Committee** in the student's final semester. The content of the exam broadly covers the material learned in the student's coursework. Satisfactory performance by the student is indicated by a majority affirmative vote of the Committee members.

Alternatively (at the **Major Advisor's** discretion), a capstone activity or course may be substituted for the final oral examination. Successful completion of the capstone activity or course (Grade of B- or higher) will complete the Non-Thesis-Master's degree.

A student who fails the capstone activity or exam may repeat it once in the following semester. In the event of failure, the **Major Advisor** will provide the student with a written summary of

the perceived deficiencies and corrective actions that need to be taken before making the second attempt. As soon as possible after the examination, the **Major Advisor** will report the results to the Dean of the Graduate School.

Deadlines and Time Limit

Although every effort will be made by both the Graduate Advisor and the **Major Advisor** to make the student aware of various University and Department regulations and deadlines, it is ultimately the student's responsibility to see that these regulations are adhered to and that the deadlines are met (see the accompanying checklist). All course work applied towards a

Non-Thesis-Master's degree must be completed within **six calendar years** after admission into the graduate program. Non-traditional students needing an exception to this time limit will send a letter to the GSAC or chair detailing the need for an exception.

Switch to Thesis-Master's or Ph.D.

In some circumstances, a student may desire to engage more fully in research. A change from a Non-Thesis to a Thesis-Master's degree will require a letter from the student's **Major Advisor**, agreeing to serve as the student's **Major Advisor** for a thesis, outlining the student's suitability for research, and how the student will complete the needed research within a reasonable time frame. This request will be considered by the GSSC. For a change to a Ph.D., students are expected to first complete their Non-Thesis-Master's degree and then apply to the Ph.D. program.

NON-THESIS M.S. IN MICROBIOLOGY CHECKLIST

Students are responsible for seeing that all deadlines are met.

Item	Date or Deadline
Annual departmental graduate student meeting	Week before classes begin in the fall semester
Plan courses for first semester	Week before classes begin
Set up and meet with Advisory Committee	During first semester of enrollment
File degree plan (“Program for the Master’s Degree and Admission to Candidacy” form) at the Graduate School: at least 30 hours of graduate course work, no more than 6 hours of BIOL 7000 (must also file any subsequent course changes)	After first committee meeting, but no later than the end of the second semester of enrollment
Turn in annual graduate student evaluation form	Usually due in March or April of each year
File “ Statement of Intention to Graduate ” at the Graduate School	During the semester of graduation (exact deadline varies)
Capstone Activity/Course or Schedule Final Oral Examination	During the final semester
Graduation	Target: 1 year

Microbiology Non-Thesis-Master's Curriculum

Year 1 Fall Semester (12 credits)

<u>Course</u>	<u>Credits</u>
BIOL 6309 Adv Topics in Quantitative Biology	3
MBIO 64xx Foundations of Microbiologic Research	4
BIOL 61xx Responsible Conduct of Research	1
BIOL 6101 Recent Advances in Cell & Molecular Biology 1 (if not taken in Spring)	
Micro Elective	3-4
Fall Total	12

Year 1 Spring Semester (12 credits)

<u>Course</u>	<u>Credits</u>
Biol 6101 Seminar Cell & Molecular Biology Presentations 1 (if not taken in Fall)	
Technical Courses/Research	3-6
2-4 Micro Electives	5-12
Spring Total	12

Year 1 Summer (6 credits)

<u>Course</u>	<u>Credits</u>
Micro Electives	3-6
Technical Courses/Research	3-6
MBIO63xx Capstone Course	3
Summer Total	6
Total	30

Required Courses

Under unusual or extenuating circumstances, the **Advisory Committee** may substitute other courses for these required courses. If the Capstone course is not completed, a final oral examination must be scheduled. Please note that course numbers are subject to change.

MBIO 64xx Foundations of Microbiologic Research (4)

BIOL 6309 Adv Topics in Quantitative Biology (3)

BIOL 61xx Responsible Conduct of Research (1)

BIOL 6101 Recent Advances in Cell & Molecular Biology (1)

MBIO 63xx Capstone Course(3)

Leveling Courses

Leveling courses can be substituted on an ‘as needed’ basis when an outstanding student without a Micro background pursues this degree. However, it is generally expected that students already show mastery in these subjects.

BIOL 5301 Advanced Genetics (3)

BIOL 5302 Advanced Cell Biology (3)

BIOL 5305 Organic Evolution for Advanced Students (3)

MBIO 5301 Advanced General Microbiology (3)

Micro Electives

Other Micro electives or Technical courses may be approved by the Microbiology committee.

Piggy-back (cannot take if received credit for the undergraduate version of the course)

BIOL 5306. Advanced Cancer Biology (3)

BIOL 5320. Advanced Molecular Biology (3)

MBIO 5401. Current Perspectives in Microbial Ecology (4)

MBIO 5403. Immunobiology (4)

MBIO 5404. Pathogenic Microbiology (4)

MBIO 5408. Microbial Genetics (4)

MBIO 6367. Molecular Biology of Parasitism (3)

BIOL 6100. Fungal Biology lab (1)

BIOL 6301. Fungal Biology (3)
BIOL 6301. Metagenomic Analysis (3)
BIOL 6301. Frontiers in Metagenomics (3)
BIOL 6301. Advanced Virology (3)
BIOL 6301. Virology II (3)
BIOL 6301. Biofilms (3)

Stand alone

BIOL 5312. Cell and Molecular Biology for Teachers (3)
BIOL 5303. Advanced Medical Entomology (3)
BIOL 6202 Grad School Prep (2)
BIOL 6301. Advanced Cell Biology II (3)
BIOL 6301. Grant Development and Writing (3)
BIOL 6301. Scientific Paper Writing (3)
BIOL 6301. Mechanisms of Innate Immunity (3)
BIOL 6305. RNA Silencing and Regulatory Small RNAs (3)
MBIO 6302. Advanced Bacterial Physiology (3)

Technical Courses

BIOL 6301/6100. Flow Cytometry and Cell Sorting (4)
BIOL 6325. R as a Research Tool: Introduction to Programming (3)
BIOL 5303/6410. Advanced Experimental Molecular Biology (4)
BIOL 6430. Experimental Molecular Biology (4)
BIOL 6435. Advanced Experimental Cell Biology (4)
BIOL 7000 Research (max 6 credits)
GEOL 5304. Techniques in Electron Microscopy and Micro-Analysis (3)

THESIS-MASTER'S PROGRAM

DEPARTMENT OF BIOLOGICAL SCIENCES,

TEXAS TECH UNIVERSITY

Revised December 2020

The Thesis-Master's degree programs in Biology and Microbiology are recommended for many students interested in a career in science, including research, teaching, and medicine. Participation in thesis research provides sophistication and insight into the workings of science beyond that available in formal course work, often facilitates the eventual pursuit of doctoral studies, and may also enhance employability through development of research skills. The student must complete at least **30 hours** of course credit beyond the Bachelor's degree, **6 hours** of which must be either BIOL, or MBIO, 6000 (Master's Thesis). Generally, students will have between 14 and 15 hours of classwork in the subject area, with the remaining hours being BIOL 7000 (Research). Although the Graduate Catalog states that only 6 hours of research can be applied toward the 30-hour total, that number is relaxed by the Graduate School for the Natural and Physical Sciences.

Admission to the Master's Degree Program

Applications for admission into the Master's degree programs in Biology and Microbiology, are considered and acted upon by the department's Graduate Student Selection Committee (GSSC). Currently, decisions to admit students are based upon:

- (1) the grade point average (GPA) over the last **60 hours** of undergraduate course work (for applicants who have or are about to receive a Bachelor's degree);
- (2) **three** favorable academic letters of recommendation;
- (3) in the case of **international students** for whom English is a second language, the scores for the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS); and
- (4) a Goals Statement. This statement (**1–2 pages** in length is sufficient) should be a specific and thoughtful explanation of the student's career goals and how an .M.S. degree from Texas Tech University will contribute toward attaining those goals. Any prior experience with scientific research should also be described.

In addition to the above criteria, each student **must** identify a faculty member who has at least provisionally agreed to serve as the student's **Major Advisor** before he or she is considered for admission into the Master's program. Students are urged to communicate directly with one or more faculty members whose research interests are most compatible with their own. **Any student who does not gain admission initially is welcome to submit a new application after improving his or her credentials.**

Advisory Committee

As soon as possible, but **no later than the end of the first semester** of enrollment in the Master's degree program, the student will form an **Advisory Committee** in consultation with his or her **Major Advisor**. This Committee is composed of **three** (or occasionally more) Graduate Faculty members, one of them being the **Major Advisor** who will serve as the Chairperson of the Committee. At least **two-thirds** of the Committee members (including the Chairperson) must be Graduate Faculty members in the Department of Biological

Sciences (this may include Adjunct Faculty). As soon as the student has filed the "Program for the Master's Degree and Admission to Candidacy" form (see the "Degree Plan" section of this handbook), the Dean of the Graduate School will officially appoint the **Advisory Committee**. It is the responsibility of the student and **Major Advisor** to inform the Graduate Advisor and the Dean of the Graduate School of any changes in the composition of the **Advisory Committee**.

The **Advisory Committee** will meet with the student at least **once a year** to advise the student and assess his or her progress towards the Master's degree. The Committee determines course requirements, approves the thesis research proposal, and conducts the final oral examination and defense of thesis.

- (1) Occasionally, it may become necessary for a student to change the composition of his or her **Advisory Committee**. Changes should follow the procedure outlined in the general guidelines in the Graduate Handbook.

Course Requirements

The student and **Advisory Committee** together will determine which courses must be taken to satisfy the M.S. degree requirements. The student is required to complete at least **30 credit hours** beyond the Bachelor's degree, **6 hours** of which must be thesis research (BIOL or MBIO 6000 Master's Thesis). In addition, the following specific requirements and considerations apply to all graduate students unless granted an exemption by the course Instructor of Record, Department Chair and Graduate Advisor.

- (1) **BIOL 6202. Preparation for Graduate Learning and Teaching in Biology.** All students are required to take BIOL 6202 during their first fall semester of enrollment in the graduate program. Failure to take the course at the appropriate time might result in dismissal of the student from the program or the loss of a teaching assistantship.
- (2) **BIOL 6301. Biological Pedagogy.** All teaching assistants are required to take this section of BIOL 6301 Advanced Topics in Biology during their first year of enrollment in the graduate program. Failure to take the course at the appropriate time might result in the loss of a teaching assistantship.

Additional courses may also be required on an individual basis as determined by the **Advisory Committee**.

- (3) **Leveling courses.** Incoming graduate students with educational gaps in their background may be required by their **Advisory Committee** to take certain courses in order to fill these gaps. These courses must be passed (with grade “C” or better).
- (4) **Languages and research tools.** The Department of Biological Sciences **does not** have a general requirement for either a foreign language or a research tool subject (for example, computer programming) for the graduate degree. However, the **Advisory Committee** may require the individual student to take such courses if they are deemed an essential part of the student’s area of research.

Deadlines and Time Limit

Although every effort will be made by both the Graduate Advisor and the **Major Advisor** to make the student aware of various University and Department regulations and deadlines, it is ultimately the student’s responsibility to see that these regulations are adhered to and that the deadlines are met (see the accompanying checklist). All course work applied towards a Master’s degree must be completed within **six calendar years** after admission into the graduate program. Non-traditional students needing an exception to this time limit will send a letter to the GSAC or chair detailing the need for an exception.

TA Support

Typically, Thesis-Master's students are supported by TAs during the long semesters. Students receiving more than 6 semesters of support have lower priority for TAs and may not be guaranteed TA support.

Degree Plan

All Master’s students must submit a “Program for the Master’s Degree and Admission to Candidacy” form to the Graduate School. This form, which must be signed by the Graduate Advisor, lists all required courses. It should be submitted as soon as possible but **no later than the second semester** of enrollment in the Master’s degree program. The Graduate Catalog should be consulted for any additional requirements that must be met before Admission to Candidacy is granted.

Subsequent changes in the degree plan must also be approved by the **Advisory Committee** and filed with the Graduate School.

Students are expected to register for a number of course hours commensurate with anticipated level of effort in their graduate studies. Except for non-traditional students or in unusual circumstances, all students who are seriously pursuing graduate degrees will be enrolled full time. Full-time enrollment is normally 9 hours in a regular semester and 3 hours in the summer session. For students on fellowships, Teaching or Research Assistantships, or other appointments that require duties other than course work and research, full-time enrollment is normally **9 hours** in a regular semester and **3 hours** in each summer session (i.e., 24 hours per calendar year). Students must maintain their full-time status even if they are devoting all of their time to research.

Students who are working on a thesis and who have begun enrollment in BIOL 6000 or MBIO 6000 Master's Thesis must meet a continuous enrollment requirement in this course, which consists of both regular semesters and at least one summer session until all degree requirements have been completed. A student who is completing a thesis but who is no longer on campus may satisfy the continuous enrollment requirement by registering for one hour in each regular semester and at least one summer session with the permission of the Department until the final semester, at which time he or she must enroll for at least three hours if the student has defended in that semester. If the student has defended in the previous semester, past the Graduate School deadline, they may register for one hour in the subsequent semester. The Graduate School should be consulted for specific information about these options.

Filing a Degree Plan

No later than the **second semester** of enrollment in the graduate program, the student must file a "Program for the Master's Degree and Admission to Candidacy" form at the Graduate School.

All requested information must be filled in on the form, including expected graduation date (month and year), thesis title or (if not yet known) area of thesis research, and all members of the **Advisory Committee**. If a proposed member of the Committee is at an institution other than Texas Tech University or the TTU Health Sciences Center, the Graduate School must be provided with his or her curriculum vitae. In general, the person's academic credentials should be equivalent to those of a Graduate Faculty member at Texas Tech University.

The student and his or her **Advisory Committee** will decide together what courses are listed on the degree plan. Under the Major column, list all of the courses that are taken to complete the M.S. degree requirements in the major subject area, including BIOL 6202. All graduate (5000 and 6000)-level courses with BIOL, BOT, MBIO, and ZOOL prefixes are considered as major courses. Formal courses are listed only by prefix and number without a title, e.g., BIOL 5320. For individual study courses or courses that can be repeated for additional credit (e.g., BIOL 6100, BIOL 6101, BIOL 6301, and BIOL 6309), different sections or specific titles should also be listed to indicate that the course does not have the same content each time it is taken. Typically, between **11 and 15 credit hours** of BIOL 7000 - Research can be included on the thesis M.S. degree plan. If the student desires, two or three courses in a subject area outside of the major can be designated as a minor and listed under the Minor column. However, this is entirely optional. A minimum of **24 credit hours** of course work exclusive of BIOL or MBIO 6000 (Master's Thesis) must be listed on the degree plan. At least six hours of Thesis must also be taken (for **a total of 30 hours**) to complete the thesis M.S. degree, but these hours do not need to be listed on the degree plan. Undergraduate courses cannot be counted toward the Master's degree. Tool, Language, or Leveling courses are listed **only** if required by the **Advisory Committee**.

The completed form must be signed by the Graduate Advisor before it is submitted to the Graduate School. The student's **Major Advisor** should communicate to the Graduate Advisor that the plan has been approved by the **Advisory Committee**. The Degree Plan is then uploaded to the Graduate School by the Graduate Administrative Assistant.

Graduation: Additional Requirements

During the semester of intended graduation, a “Statement of Intention to Graduate” must be filed at the Graduate School, and payment of the ETD document processing fee and all other required fees must be posted to the student’s University bill. Since exact dates for these requirements vary with the semester, the current “Graduation Deadlines” posted on the Graduate School web site should be consulted.

Research Proposal

In consultation with his or her **Major Advisor** and **Advisory Committee** members, the student will develop a written thesis research proposal by the end of the student’s **first** year. This document will include an abstract, research plan, and supporting data. Generally, a document of 5–8 pages in length is sufficient. Copies of the proposal should be submitted to each Committee member **two weeks** prior to a Committee meeting to give the proposal formal consideration. At this meeting, the student will make an oral presentation of the proposed research and will receive suggestions for improvements. The revised version of the proposal should then be submitted to the Committee members for final approval. A copy of the proposal cover page, signed by all Committee members, must be delivered to the Graduate Administrative Assistant. The **Advisory Committee** is to be informed of **major changes** in the research and may require submission of a new thesis proposal if a drastic change, such as an entirely new project or research goals, is contemplated.

Final Oral Examination and Defense of Thesis

Before earning the M.S. degree, each Thesis-Master's student must pass a final oral examination and defense of thesis. After the **Advisory Committee** has judged that the thesis is in a defensible form, the graduate student may then set a date for the examination and defense with the approval of all Committee members, which must be scheduled at least **three weeks** in advance. Thus, the student should plan to deliver the **Major Advisor**-approved version of the thesis to the other Committee members at least four weeks before he or she intends to defend. In scheduling the examination and defense, students should be aware that the final, Committee-approved copy of the thesis, signed Thesis-Dissertation Approval Form, and Electronic Thesis-Dissertation (ETD) Signature Form must be turned in to the Graduate School within **two weeks** of the defense **AND no later than the date** in the “Graduation Deadlines” posted on the Graduate School web site. Sufficient time should be allowed before this deadline to make all necessary revisions to the thesis. Students should also understand that faculty members may not be available for a thesis defense during the summer.

The examination and defense is administered by the student’s **Advisory Committee**. The student is expected to deliver a concise and well-organized presentation covering the salient points of the thesis, stressing its contribution(s) to scientific knowledge. This presentation and following question-and-answer session is open to all faculty, graduate students, and others who care to attend. Afterwards, the student will meet privately with the Advisory Committee for a more in-depth discussion of the merits and weaknesses of the thesis and

further oral examination. As soon as possible after the examination and defense, the Major Advisor will report the results to the Dean of the Graduate School.

Satisfactory performance by the student is indicated by a majority affirmative vote of the Committee members. A student who fails the examination and defense may repeat it once, but only after an interval of four months or more. In the event of failure, the **Major Advisor** will provide the student with a written summary of the perceived deficiencies and corrective actions that need to be taken before making the second attempt.

Master's Thesis

The Master's thesis represents original research conducted by the student under the direction of his or her **Major Advisor** and **Advisory Committee**. It is to be written clearly and concisely in correct English. The required format for the thesis is described in the "Thesis/Dissertation Formatting Guidelines," which is available as a pdf file on the Graduate School web site.

After being approved by the **Major Advisor**, a completed version of the thesis (not necessarily the final one) will be given to all other members of the **Advisory Committee** at least **three weeks** prior to the anticipated date of the final oral examination and defense of thesis. Within **one week**, the Committee members will determine whether the thesis is defensible. "Defensible" means that it is structurally sound, based on the criteria for articles in a quality journal in the field of study, and that the Committee is able to assess the validity of the presented research. "Defensible" does not mean that the Committee members approve of the scientific content of the thesis or will pass the student in the thesis defense. If the thesis is judged defensible, then the defense can go forward as scheduled. If one or more Committee members do not find the thesis to be defensible, or if they perceive any major flaws in the methodology, analysis, or interpretation of data, these problems should be communicated to the **Major Advisor** and graduate student within the one-week period. Any disputes that cannot be resolved will be taken for arbitration first to the Graduate Advisor and then, if necessary, to the Chairperson of the Department.

Switch to Non-Thesis-Master's

In some circumstances a student will be unable to complete a thesis. In this case, they may opt to change their degree to a Non-Thesis-Master's. They would need to form an **Advisory Committee** that may be the same or different as the thesis committee, file an amended degree plan and schedule the final qualifying exam if they have enough credits.

THESIS M.S. CHECKLIST

Students are responsible for seeing that all deadlines are met.

Item	Date or Deadline
Choose Major Advisor	Prior to entry into the graduate program
Annual departmental graduate student meeting	Week before classes begin in the fall semester
Plan courses for first semester: BIOL 6202 (Preparation for Graduate Learning and Teaching in Biology) and BIOL 6301 (Biological Pedagogy) are required during first fall enrollment	Week before classes begin
Set up and meet with Advisory Committee	During first semester of enrollment
File degree plan ("Program for the Master's Degree and Admission to Candidacy" form) at the Graduate School: at least 30 hours of graduate course work including 6 hours of BIOL 6000, or MBIO 6000, 0 (Master's Thesis) is required (must also file any subsequent course changes)	Preferably after first committee meeting, but no later than the end of the second semester of enrollment
Present thesis research proposal to the Advisory Committee	As soon as possible after filing the degree plan but no later than the end of the second semester of enrollment
Turn in annual graduate student evaluation form	Usually due in March or April of each year
Annual Committee Meetings	Students should meet with their Advisory Committee at least once per year
File " Statement of Intention to Graduate " at the Graduate School	During the semester of graduation (exact deadline varies)

THESIS M.S. CHECKLIST, continued

Submit a completed version of the thesis to all Advisory Committee members for review	At least three weeks before the anticipated thesis defense
Obtain approval of all Advisory Committee members to schedule the thesis defense	During the semester of graduation (exact deadline varies)
Pay Electronic Thesis Dissertation (ETD) processing fee	During the semester of graduation (exact deadline varies)
Take Final Examination and Defense of Thesis (Major Advisor reports the result to the Graduate School)	During the semester of graduation (exact deadline varies)
Submit thesis for formatting review; turn in signed Thesis-Dissertation Approval Form and ETD Signature Form to the Graduate School	During the semester of graduation (exact deadline varies)
Upload corrected, final version of thesis to the ETD Submission web site	During the semester of graduation (exact deadline varies)
Graduation	Target: two to three years

Sample Timeline for Fall semester start	Long Semester					
Task	1	2	3	4	5	6
Form Advisory Committee (3+ faculty, majority Biol)						
Committee Meeting: File Degree Plan						
Committee Meeting: Research Proposal						
Annual Committee Meeting						
File Annual Accomplishments						
Submit Thesis to committee (3 weeks prior to defense)						
Defend Thesis (before grad school deadline)						
Correct Thesis						
Submit thesis/pay fees (within 2 weeks of defense)						

DOCTORAL PROGRAM

DEPARTMENT OF BIOLOGICAL SCIENCES

TEXAS TECH UNIVERSITY

Revised December 2020

The Department of Biological Sciences offers doctoral degree programs in Biology for students who want to prepare for research-oriented careers in the life sciences. Making a contribution to scientific knowledge through original research is often the most satisfying aspect of a student's graduate experience. All doctoral students are strongly encouraged to begin their research as soon as they undertake their graduate studies.

The Graduate School has mandated the following requirements for the Ph.D. degree.

- (1) The student must complete at least **72 hours** of course credit beyond the Bachelor's degree, 12 of which must be Dissertation research (BIOL 8000 Doctor's Dissertation). If the student wishes to declare a minor, at least 45 hours are required (including BIOL7000) in the major subject area and 15 hours of coursework in the minor subject area.
- (2) The student must pass a **Qualifying Examination**, generally consisting of a series of comprehensive written exams (ordinarily at least a six hours-long cumulative, not necessarily continuous) followed by an oral exam. If the committee approves, the **Qualifying Examination** may instead consist of a grant proposal on a topic peripheral to the dissertation research written in a format consistent with NIH, NSF or USDA guidelines. If the committee approves the proposal, then an oral examination dealing with the proposal topic is then administered.
- (3) The student must complete a Dissertation that meets Graduate School specifications and make an **oral Defense** of a substantial research investigation described in the doctoral Dissertation. The **Advisory Committee** and the Dean of Graduate School must approve the subject of the Dissertation at least four months before the candidate's proposed date of graduation; often this takes the form of a successfully defended Dissertation proposal (a pre-requisite for taking the Qualifying Exam).

GENERAL PROGRAM REQUIREMENTS

Admission to the Doctoral Program

All applications for admission into the doctoral programs in Biology and Zoology are evaluated and voted upon by the Graduate Student Selection Committee (GSSC). A Master's degree is preferred as a credential for entry into the doctoral program, but students

with outstanding undergraduate records may be admitted directly. Decisions to admit students are based upon the following criteria:

- (1) the grade point average (GPA) over the last **60 hours** of undergraduate course work (for applicants who have or are about to receive a Bachelor's degree) and any formal graduate course work that has already been taken (for applicants who have or are about to receive a Master's degree);
- (2) **three** favorable academic letters of recommendation;
- (3) in the case of **international students**, for whom English is a second language, the scores for the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS); and
- (4) a Goals Statement. This statement (**1–2 pages** in length is sufficient) should be a specific and thoughtful explanation of the student's career goals and how a doctoral degree from Texas Tech University will contribute toward attaining those goals. Any prior experience with scientific research should also be described.

In addition to the above criteria, each student must identify a faculty member who has at least provisionally agreed to serve as the student's **Major Advisor** before he or she is considered for admission into the doctoral program. Students are urged to communicate directly with one or more faculty members whose research interests are most compatible with their own. **Any student who does not gain admission initially is welcome to submit a new application after improving his or her credentials.**

Academic Standing in the Program

A student who is on schedule for completion of the degree program (see the accompanying checklist) and who maintains **a GPA of at least 3.0** is considered in good academic standing, unless he or she receives the grade of **"C" in six or more hours** of any courses used to satisfy the degree plan (listed on the "Program for the Doctoral Degree" form – see the "Degree Plan" section of this handbook), or a grade of **"D" or "F" in any graduate course**.

Once each year (usually in April), all graduate students are required to complete an evaluation form reporting on various aspects of their progress toward their degree. The Graduate Student Affairs Committee (GSAC) uses this form to assess the progress and academic standing of each graduate student. Students who are not making adequate progress or who fall from good academic standing may be referred to the Chairperson of the Department for review and possible loss of Teaching Assistantship or dismissal from the graduate program.

Required Courses and Responsible Academic Conduct Training

An essential part of the graduate experience is to raise the awareness to professional standards of research ethics, integrity, and safety, and of challenges that students may face throughout their careers. The Grad School in collaboration with the Office of Research and Innovation has developed a responsible scholarship training that addresses academic

practices such as data management, intellectual property, management of conflict of interest, ethical use of humans and animals in research, social responsibility of research, effective collaboration, and research misconduct. This training is required for all new and continuing degree-seeking graduate students and meets the U.S. National Science Foundation-mandated “Responsible Conduct of Research” training for students who conduct research on NSF grants. Separate training modules are available for different disciplines; for Biology students there is the course “Biological Science Responsible Scholarship.” New students must complete training within their first year; returning students must complete training by November 16. Graduate students who do not complete the training by the deadline will have registration holds placed on their enrollment records. See <https://www.depts.ttu.edu/gradschool/training/responsible-academic-conduct-training.php> and <https://www.depts.ttu.edu/gradschool/training/CITIInstructions.pdf>

The student and **Advisory Committee** together will determine which courses must be taken to satisfy the doctoral degree requirements. The student is required to complete at least **72 credit hours** beyond the Bachelor’s degree, **12 hours** of which must be Dissertation research (BIOL 8000 Doctor’s Dissertation). In addition, the following two specific courses are required of all graduate students wanting to teach in the Department of Biological Sciences unless granted an exemption by the Instructor of Record, Department Chair and Graduate Advisor.

(1) BIOL 6202. Preparation for Graduate Learning and Teaching in Biology.

All students are required to take BIOL 6202 during their first fall semester of enrollment in the graduate program. Failure to take the course at the appropriate time might result in dismissal of the student from the program or the loss of a Teaching Assistantship. Students with previous teaching assistantship experience should examine the course syllabus and may petition to have the requirement waived.

(2) BIOL 6301. Biological Pedagogy. All Teaching Assistants are required to take this section of BIOL 6301 Advanced Topics in Biology during their first year of enrollment in the graduate program. Failure to take the course at the appropriate time might result in the loss of a Teaching Assistantship. Students with previous teaching assistantship experience should examine the course syllabus and may petition to have the requirement waived.

Additional courses may also be required on an individual basis as determined by the **Advisory Committee**:

(3) Leveling courses. Incoming graduate students with educational gaps in their background may be required by their **Advisory Committee** to take certain courses in order to fill these gaps. These courses must be passed (with grade “C” or better).

(4) Languages and research tools. The Department of Biological Sciences **does not** have a general requirement for either a foreign language or a research tool subject (for example, computer programming) for the graduate degree. However, the **Advisory Committee** may require the individual student to take such courses if they are deemed an essential part of the student’s area of research.

REQUIREMENTS FOR COMPLETION OF THE DEGREE

Advisory Committee

As soon as possible, but **no later than the second semester** of enrollment in the doctoral degree program, the student will form an **Advisory Committee** in consultation with his or her **Major Advisor**. This Committee is composed of **five** (occasionally more) Graduate Faculty members, one of them being the **Major Advisor** who will serve as the Chairperson of the Committee. At least **three-fifths** of the Committee members, including the Chairperson, must be Graduate Faculty members in the Department of Biological Sciences (this may include Adjunct Faculty). Except in special cases approved by the Graduate Dean, only Graduate Faculty may serve on Thesis and Dissertation Committees. OP 64.10 has additional information for the approval of external committee members (faculty at different institutions). Upon filing of the “Program for the Doctoral Degree” form (see the “Degree Plan” section of this handbook), the Dean of the Graduate School will officially appoint the **Advisory Committee**. It is the responsibility of the student and **Major Advisor** to inform the Graduate Advisor and the Dean of the Graduate School of any changes in the composition of the **Advisory Committee** and to update the Degree Plan as soon as possible in the event of changes.

The **Advisory Committee** will meet with the student at least **once a year** to advise the student and assess his or her progress towards the doctoral degree. The Committee determines course requirements, approves the Dissertation research proposal, administers the written and oral Qualifying Examinations, and conducts the Final examination and Dissertation defense.

Occasionally, it may become necessary for a student to change the composition of his or her **Advisory Committee** following the guidelines outlined in the general section.

Preliminary Diagnostic Examination

The student’s **Major Advisor** or **Advisory Committee** may require the student to pass a preliminary examination in the major and minor fields of the degree program to facilitate evaluation and counseling of the student. This is essentially unknown in Biological Sciences but is listed in the Graduate Catalog. If required, the **Major Advisor** will coordinate the administration of the examination, which may be either written or oral and should be taken as soon as possible but no later than the student’s **second semester** of enrollment in the graduate program.

Enrollment for Ph.D. Degree

All graduate students are required to register for appropriate courses in **every** semester or summer session in which they expect to receive financial assistance, use the facilities of the University and faculty time, or take comprehensive examinations. If enrollment is interrupted during the summer, the student may be required to pay additional fees upon re-enrollment in the following fall semester.

Students are expected to register for a number of course hours commensurate with the anticipated level of effort in their graduate studies. Except in unusual circumstances, all students who are seriously pursuing graduate degrees will be enrolled full time. Full-time enrollment is normally 12 hours in a regular semester and 6 hours in each summer session. For students on fellowships, assistantships, or other appointments that require duties other than course work and research, full-time enrollment is normally **9 hours** in a regular semester and **3 hours** in each summer session (i.e., 24 hours per calendar year). Students must maintain their full-time status even if they are devoting all of their time to research.

The Graduate School requires all doctoral students to satisfy a residence requirement that consists of full-time enrollment for at least two consecutive semesters. For the purposes of this residence requirement, both summer sessions are considered equivalent to one regular semester.

Students who are working on a Dissertation and who have begun enrollment in BIOL 8000 Doctor's Dissertation must meet a continuous enrollment requirement in this course, which consists of both regular semesters and at least one summer session until all degree requirements have been completed. A student who is completing a Dissertation but who is no longer on campus may satisfy the continuous enrollment requirement by registering for one hour in each regular semester and at least one summer session with the permission of the Department until the final semester, at which time he or she must enroll for at least three hours. The Graduate School should be consulted for specific information about these options.

Degree Plan

No later than the **second semester** of enrollment in the graduate program, the student must file a "Program for the Doctoral Degree" form (Degree Plan) at the Graduate School.

All requested information must be completed, including expected graduation date (month and year), Dissertation title or (if not yet known) area of Dissertation research, and all members of the **Advisory Committee**. If a proposed member of the Committee is at an institution other than Texas Tech University or the TTU Health Sciences Center, the Graduate School must be provided with his or her curriculum vitae. In general, the person's academic credentials should be equivalent to those of a Graduate Faculty member at Texas Tech University. The "proposed enrollment pattern for residence year" lists the planned hours of enrollment in each semester; for example, "9-9-3-3" for full-time enrollment in the fall, spring, and both summer sessions when the student is being supported by an assistantship (if not supported by a TA/RA then students do not necessarily need to enroll during the summers).

The student and his or her **Advisory Committee** will decide together what courses are listed on the degree plan. Under the Major column, list all of the courses that are taken to complete the doctoral degree requirements in the major subject area, including BIOL 6202 and BIOL

6301 (pedagogy course) unless granted an exemption. All graduate (5000 and 6000)-level courses with BINF, BIOL, BOT, MBIO, and ZOOL prefixes may be considered as major courses. Formal courses are listed only by prefix and number without a title, e.g., BIOL 5320. For individual study courses or courses that can be repeated for additional credit (e.g., BIOL 6100, BIOL 6101, BIOL 6301, and BIOL 6309), different sections or specific titles should also be listed to indicate that the course does not have the same content each time it is taken. Approval of more than ~25 hours of BIOL 7000 may be granted on a case-by-case basis. If the student desires, at least 15 hours in a subject area outside of the major can be designated as a minor and listed under the Minor column. However, this is entirely optional. A minimum of **60 credit hours** of course work (e.g., ~40 hours of formal coursework, ~20 hours of BIOL7000) exclusive of BIOL 8000 Doctor's Dissertation must be listed on the degree plan. At least 12 hours of Doctor's Dissertation must also be taken (for **a total of 72 hours**) to complete the doctoral degree, but these hours do not need to be listed on the degree plan. Undergraduate courses cannot be counted toward the doctoral degree. Tool, Language, or Leveling courses are listed only if required by the **Advisory Committee** or to meet English Proficiency requirements based on the SPEAK test administered to international students. If the student wishes to receive transfer credit for graduate courses taken at another institution, the course prefixes and numbers on the student's transcript from that institution must be listed as well as the equivalent graduate courses at Texas Tech University. The student should be prepared to provide the Graduate Advisor and the Graduate School with copies of the transcript. Up to 12 hours of course credit can be transferred.

If the student has already earned a Master's degree, either from Texas Tech University or another accredited institution, the Graduate School will accept up to 30 credit hours of course work taken at the Master's level for transfer to the doctoral degree. However, transfer credit is **not** given for BIOL 6000 Master's Thesis (or equivalent courses at other institutions).

The completed form must be signed by the Graduate Advisor before it is submitted to the Graduate School. The student's **Major Advisor** should either initial (**not sign**) the form or send a short note to the Graduate Advisor indicating that the plan has been approved by the **Advisory Committee**.

Research Proposal

In consultation with his or her **Major Advisor** and **Advisory Committee** members, the student will develop a written Dissertation research proposal. This document will include an abstract, research plan, supporting data, and budget. Generally, a document of 8–10 pages in length is sufficient. Copies of the proposal should be submitted to each Committee member **two weeks** prior to a Committee meeting to give the proposal formal consideration. At this meeting, the student will make an oral presentation of the proposed research and will receive suggestions for improvements. The revised version of the proposal should then be submitted to the Committee members for final approval. A copy of the proposal cover page, signed by all Committee members, must be delivered to the Graduate Secretary. The **Advisory Committee** is to be informed of **any major changes** in the research and may require

submission of a new Dissertation proposal if a drastic change, such as an entirely new project or research goals, is contemplated.

Qualifying Examination

The Qualifying Examination for Admission to Candidacy follows the **Advisory Committee** approval of the Research proposal, and is a formal evaluation of the student's ability to consolidate, synthesize, and apply the formal knowledge that he or she has gained in the major and (if applicable) minor subject areas. Students must take this examination within one calendar year of completing all requirements listed on the degree plan. The **Advisory Committee** prepares and administers the Qualifying Examination, which consists of both written and oral components. Each Committee member will prepare a separate written examination. Under the supervision of the **Major Advisor**, all of the written examinations will be taken by the student during a period of one week (Monday–Friday). The Oral Examination must then be held within **two weeks** after completion of the written examinations.

At the discretion of the Committee the Qualifying Examination can be administered in the form of a **grant proposal** written by the student on a topic agreed upon by the Committee and the student. This proposal will be in the format of an NIH, NSF or USDA proposal and will be in an area that is **peripheral** to the student's doctoral research proposal (that is it cannot be the dissertation research). It will be submitted to the Committee and 2-3 weeks later there will be an **oral examination** based on the research area discussed in the proposal.

The student's performance on both the written and the oral components of the qualifying examination (regardless of the exam format) must be approved by at least **a majority** of the Committee members before the student may be recommended for Admission to Candidacy for the doctoral degree.

The **Major Advisor**, on behalf of the **Advisory Committee**, will complete the "Qualifying Exam and Admission to Candidacy Recommendation Form" and submit it to the Graduate School after the student successfully completes the qualifying examination.

The **Major Advisor** will notify the Dean of the Graduate School in writing if the results of the examination are unsatisfactory. In the event of failure, the **Major Advisor** will also provide the student with a written summary of the perceived deficiencies and corrective actions that need to be taken before making another attempt. A student may repeat the Qualifying Examination once, but only after an interval of **at least four months and not more than 12 months** from the date of the first attempt. Failure to pass the Qualifying Examination a second time will result in dismissal from the graduate program.

Admission to Candidacy

If the Qualifying Examination is considered satisfactory and other requirements have been completed (e.g., leveling courses, language and research tool courses, and BIOL 6202 and Biological Pedagogy – BIOL 6301), the **Major Advisor**, on behalf of the **Advisory Committee**, will send a letter promptly to the Dean of the Graduate School recommending

that the student be admitted to candidacy. The letter will include the date of the oral examination. If an official minor has been designated, then the letter must indicate whether or not the student passed both the major and minor portions of the exam. The **Advisory Committee** recommendation will then be submitted to the Graduate Council by the Dean of the Graduate School. The Graduate Council might approve the **Advisory Committee's** recommendation or, after consultation with the Committee, it might suggest additional requirements that the student must satisfy.

The Dean of the Graduate School will transmit in writing the results of the Graduate Council's decision to the applicant, **Major Advisor**, and Graduate Advisor. A student must be admitted to candidacy for the doctoral degree at least **four months** prior to the proposed graduation date.

The semester after candidacy is achieved, the student will receive a \$1000 per academic year increase in their stipend. That salary increase will continue throughout the remainder of their doctoral studies up to the five year limit.

Doctoral Dissertation

The doctoral Dissertation represents substantive, original research conducted by the student under the direction of his or her **Major Advisor** and **Advisory Committee**. It must be written clearly and concisely in correct English. The required format for the dissertation will be evaluated by the Graduate School.

Final Examination and Dissertation Defense

Before earning the doctoral degree, each doctoral student must pass a Final oral examination and defense of the Dissertation. After the **Advisory Committee** has judged that the Dissertation is in a defensible form, the graduate student may then set a date for the examination and defense with the approval of all Committee members, which must be scheduled at least **three weeks** in advance. Thus, the student should plan to deliver the **Major Advisor**-approved version of the Dissertation to the other Committee members at **least four weeks** before he or she intends to defend. The student must also file the "Doctoral Final Oral Examination Notification Form" at the Graduate School. In scheduling the examination and defense, students should be aware that the final, Committee-approved copy of the Dissertation, signed Thesis-Dissertation Approval Form, and Electronic Thesis-Dissertation (ETD) Signature Form must be turned in to the Graduate School within **two weeks** of the defense or **no later than the date** in the "Graduation Deadlines" posted on the Graduate School web site. Sufficient time should be allowed before this deadline to make all necessary revisions to the Dissertation. Students should also understand that faculty members may not be available for a Dissertation defense during the summer.

The examination and defense is administered by the student's **Advisory Committee** and in the presence of a Representative appointed by the Dean of the Graduate School. The student is expected to deliver a concise and well-organized presentation covering the salient points of the Dissertation, stressing its contribution(s) to scientific knowledge. This presentation and following question-and-answer session is open to all faculty, graduate students, and others who care to attend. Afterward, the student will meet privately with the **Advisory Committee**

and Graduate Dean's Representative for a more in-depth discussion of the merits and weaknesses of the Dissertation and further oral examination. As soon as possible after the examination and defense, the **Major Advisor** will report the results to the Graduate Dean. Satisfactory performance by the student is judged by a **majority** affirmative vote of the **Advisory Committee** members. In the event of failure, the Graduate School does not ordinarily permit the student to repeat the Final Examination and defense.

Graduation: Additional Requirements

During the semester of intended graduation, a "Statement of Intention to Graduate" must be filed at the Graduate School, and payment of the ETD document processing fee and all other required fees must be posted to the student's University bill. Since exact dates for these requirements vary with the semester, the current "Graduation Deadlines" posted on the Graduate School web site should be consulted.

Maximum Allowable Doctoral Hours

The Texas Legislature has capped State-funded financial assistance for graduate study at 99 doctoral hours (that's four years of fulltime study past the Master's degree) for most programs and may impose sanctions upon universities permitting registration for excess hours. Graduate students with more than 99 doctoral hours are required to pay out-of-state tuition, regardless of residence status. The maximum time allowed for completing the doctoral degree is eight years from the first semester of doctoral enrollment or four years from admission to candidacy, whichever comes first.

To avoid these infractions, the Graduate School has adopted several policies to manage graduate enrollment. The Graduate School will initiate a formal review of all doctoral students who are approaching the 99-hour limit, and these students must present a plan for prompt completion of the doctoral degree. **Any student who has exceeded 99 doctoral hours is strongly encouraged to contact the Graduate School and make certain of all requirements pertaining to continued enrollment.** Students not making timely progress toward completion of the doctoral degree are subject to termination by the Dean of the Graduate School. Accumulation of excess hours while failing to complete the degree constitutes unsatisfactory progress.

Deadlines and Time Limit

Although every effort will be made by both the Graduate Advisor and the **Major Advisor** to make the student aware of various University and Department regulations and deadlines, it is ultimately the student's responsibility to see that these regulations are adhered to and that the deadlines are met (see the accompanying checklist).

At least **four months** must intervene between the Qualifying Examination and the Final examination and Dissertation defense. **All work for the doctoral degree must be completed within eight consecutive calendar years or four calendar years from admission to candidacy, whichever comes first.**

Professional Conduct in Teaching and Research

All graduate students are expected to maintain the highest standard of professional ethics in the conduct of their research. Plagiarism, selective and inappropriate manipulation of experimental data to achieve desired outcomes, and outright falsification of data all constitute scientific fraud. Such conduct will not be tolerated and provides sufficient cause to dismiss the student from the graduate program.

All original research data collected by the graduate student must remain permanently with the laboratory where the work was done. No record of the data, including research notebooks and computer files, may be removed from the laboratory **without the written consent of the Major Advisor**. In return, the graduate student is given the opportunity to publish these data in a timely manner.

DOCTORAL PROGRAM CHECKLIST

Students are responsible for seeing that all deadlines are met.

Item	Date or Deadline
Choose Major Advisor	Prior to entry into the graduate program
Departmental graduate student meeting	Week before classes begin in the fall semester
Plan courses for first semester: BIOL 6202 (Preparation for Graduate Learning and Teaching in Biology) is required during first fall enrollment	Week before classes begin
Set up and meet with Advisory Committee	Before end of second semester of enrollment
Take preliminary examination (if required by the Advisory Committee)	During first semester of enrollment

File degree plan (“Program for the Doctoral Degree” form) at the Graduate School: at least 72 hours of graduate course work including 12 hours of BIOL 8000 (Doctor’s Dissertation) is required (must also file any subsequent course changes)	As soon as possible but no later than the end of the second semester of enrollment
Present Dissertation Research Proposal to the Advisory Committee	As soon as possible after filing the degree plan but no later than the end of the second semester of enrollment
Turn in annual graduate student evaluation form	Usually due in April of each year
Take written and oral Qualifying Examination (Major Advisor reports the result to the Graduate School)	No later than end of the third year of enrollment
File “ Statement of Intention to Graduate ” at the Graduate School	During the semester of graduation (exact deadline varies)
Submit a completed version of the Dissertation to all Advisory Committee members for review	At least four weeks before the anticipated Dissertation defense
Obtain approval of all Advisory Committee members to schedule the Dissertation defense	During the semester of graduation (exact deadline varies)
File “ Doctoral Final Oral Examination Notification Form ” at the Graduate School	At least three weeks prior to the scheduled defense date

Pay Electronic Thesis Dissertation (ETD) processing fee	During the semester of graduation (exact deadline varies)
Take Final Examination and Dissertation Defense (Major Advisor reports the result to the Graduate School)	During the semester of graduation (exact deadline varies)
Submit Dissertation for formatting review; turn in signed Thesis-Dissertation Approval Form and ETD Signature Form to the Graduate School	During the semester of graduation (exact deadline varies)
Upload corrected, final version of Dissertation to the ETD Submission web site	During the semester of graduation (exact deadline varies)
Graduation	Target: five years

Frequently Asked Questions

Financial Matters

1. Is there a limit to the number of semesters that I can receive financial support from the Department as a Teaching Assistant (TA), Graduate Assistant (GA), or as a Research Assistant (RA)?

A student who is in good standing academically, making appropriate progress toward completion of his or her degree as determined by the timely completion of required paperwork, annual progress reports, cumulative GPA > 3.0, and adequate performance evaluations in prior TA assignments will have ties as a TA has priority in the assignment of a TA position (see below).

RA support is at the discretion of the Major Advisor.

The maximum number of semesters that one can have a TA or RA depends on the time limit for a degree, and maintenance of good academic standing. Master's students will be supported during the Fall and Spring Semesters for up to three years, and Ph.D. students for up to 5 years. Summer support is considered separately, but likewise limited to the first three or 5 summers in the program (if available; summer budgets are determined by the university administration separately each academic year). Extensions for TAship appointments beyond these time limits are reviewed by the Graduate Advisor and Department Chair with input from the student's **Advisory Committee** and are determined based on departmental and student need. Doctoral students are encouraged to apply for a Graduate School Doctoral Dissertation Completion Fellowship after they advance to candidacy (see details under the Doctoral Program section of the Handbook. Students must be nominated Nov 15- Jan. 15th by their **Major Advisor** and endorsement of the department Chair to compete for this one year award. See <https://app.smarterselect.com/prograM.S./59965-Texas-Tech-Graduate-School>.

2. Is there a ranking system to determine which graduate students receive financial support?

The number of TA-ships available each semester varies slightly based on curricular needs. In cases where there are more students requesting support than classroom sections needing TAs, the department does use a ranking system to assign students to classes. All other factors being equal, preference is towards support of Ph.D. students over Thesis-based M.S. students; with Non-Thesis M.S. students ranking below both. In addition, the department makes an effort to spread TA-ships across faculty labs and prioritizes support for students of junior faculty over those of senior faculty. Students who have received poor teaching evaluations in prior semesters are ranked lower than those that receive good evaluations. In the absence of extenuating circumstances M.S. students that have already received 3 years of support and Ph.D. students that have already received 5 years of support will have the lowest priority

3. What is the possibility of receiving summer support from the Department?

A limited number of TA positions are available during the summer. In recent years, the Department has tried to provide a TA or RA to every graduate student who needs one for at least one of the two summer sessions. This is consistent with F1 visa requirements for international grad students who are obliged to enroll full time (9 hours in long semesters, 3 hours in summer). However, the extent to which this remains possible will depend on the size of the annual budget, summer school course offerings by the department, and ad hoc summer budget adjustments by the administration.

4. If I am being paid as an RA or TA and I interrupt or terminate my degree program in mid-semester, am I effectively breaking a binding contract with my **Major Advisor** or with the Department?

Yes. Your assistantship, as stipulated in your offer letter, has a fixed appointment period, usually 2 long semesters (Fall and Spring). Once you accept a TA-ship or GA-ship, you may request that your appointment be terminated prior to its expiration. However, the time for termination must be agreed upon by both you, your supervisor, and the Departmental Chairperson. If a replacement cannot be found to meet your teaching obligations, you may be required to complete your contract. Students who do refuse to complete their contract, if needed, will not be offered additional TA support unless exceptional circumstances were in effect.

If you are offered an RA-ship by your major professor, how you complete your assigned duties is up to the discretion of your major professor.

Leaves of Absence

1. Can I take a leave of absence from the University (or Department) while my degree program is in progress? If so, under what circumstances is a leave of absence granted?

Leaves of absence are granted only for exceptional personal or professional circumstances that would severely hamper the student's ability to continue working toward completion of the degree. Examples would include a family crisis, extended serious illness, or financial catastrophe. Normally, leaves of absence will not exceed one year and do not extend the maximum time allowed for completion of the degree. Requests should be submitted through the Graduate School Enrollment Services portal. Each request for a leave of absence requires a letter from the student explaining the need for a leave and supporting letters from each member of the student's **Advisory Committee**. The case is then reviewed by the Graduate Student Affairs Committee and the departmental chairperson. If a decision in favor of the student's request is made, a recommendation is sent to the Graduate Associate Dean for Student Affairs, who makes the final decision. Should a student wish to appeal a negative decision, the issue should be discussed with the chairperson, who can advise him or her of the proper procedures to follow. When granted, leaves of absence normally do not exceed one year.

2. Should I request a leave of absence if I anticipate being away from my employment duties for a short time, such as for the birth of a child, scheduled surgical procedure, etc.?

It is unnecessary to request a formal leave of absence when the duration of an anticipated absence from employment duties will be short (a few days or weeks). However, you must be proactive and make appropriate arrangements for any such absence **in advance** with your **Major Advisor** (RA) or with the course coordinator and departmental chairperson (TA).

3. If I interrupt my graduate studies for an extended period of time, how does this affect my standing in the graduate program when I return?

If a student has received a leave of absence from the Graduate School, there is no change in his or her standing upon return. If the student takes an unauthorized leave and fails to maintain continuous enrollment, he or she must apply for readmission to both the Graduate School and to the Department. In addition, once a student has started taking BIOL/MBIO 6000 Master's Thesis or BIOL 8000 Doctoral Dissertation, he or she must continue to enroll in it every fall and spring semester and at least once each summer for at least one hour until graduation. Graduate students may start taking the BIOL 6000 generally after completing 15 hours of coursework and BIOL 8000 courses after successfully passing the Qualifying Examination for the Ph.D.

Major Advisor/Advisory Committee

1. What should I do if I have a disagreement with my **Major Advisor** (major professor) concerning the composition of my **Advisory Committee**?

The **Advisory Committee** consists of Graduate Faculty members chosen together by the **Major Advisor** and the graduate student. A serious disagreement about the composition of the committee could lead to problems during the conduct of the research. The student and **Major Advisor** should first try to resolve the situation themselves. Failing that, the departmental Chairperson may be asked to serve as a mediator in such a dispute. However, if the dispute is irreconcilable, the student should consider asking another professor to serve as his or her **Major Advisor**.

2. Can I switch **Major Advisors** without consulting my current **Major Advisor** or my **Advisory Committee**?

Although you may switch your **Major Advisor**, you must show courtesy by letting him or her know about your plans and the reasons for your decision. It may be that a misunderstanding has occurred that can be resolved without the need for making such a change. You may convey your decision directly to your **Major Advisor** or through the department Chairperson.

In either case, your advisor then has an opportunity to express his or her opinion and make any attempt to work out problems. that may have precipitated the need for a change.

3. Can I remove or replace a member of my **Advisory Committee** other than my **Major Advisor**?

Any change in your **Advisory Committee** must be made in consultation with your **Major Advisor**. Follow the procedures outlined above when considering replacing a committee member.

4. Can I switch from the M.S. to the Ph.D. program without completing the Master's degree?

Any student admitted to the M.S. program is expected to fulfill the original intent of the application. In **exceptional situations**, an M.S. student may request that he or she be considered for admission to the Ph.D. program without completing all of the requirements for the M.S. degree. The following policy exists. An M.S. student may only request such changes to the Ph.D. program after completing at least two regular (fall, spring) semesters of graduate study. The **Graduate Student Selection Committee** will decide whether or not to approve such a request. For an applicant to be considered for the change to the Ph.D. program, he or she must have met at least two (preferably, all three) of the following criteria:

- (1) has academic credentials (standardized test scores, GPA for the last 60 hours of undergraduate study, letters of recommendation, and other subjective criteria) that are equivalent to those acceptable for any first-time applicant to the graduate program directly at the Ph.D. level;
- (2) has demonstrated outstanding research potential as documented by a unanimous endorsement in writing from the Master's **Advisory Committee** and based on a formal (seminar) presentation of research results; and/or
- (3) has at least documented submission, but preferably acceptance/publication of a first-author manuscript in a peer-reviewed journal.

The student must provide the Graduate Student Selection Committee with a new Goals Statement emphasizing research accomplishments, the reason for requesting the change, and the work to be performed at the Ph.D. level. Letters supporting the change and addressing evidence for outstanding research potential must be supplied by each M.Sc. **Advisory Committee** member. The Graduate Student Selection Committee will make a holistic evaluation using the same criteria required of any applicant seeking to enter graduate school for the first time. However, the letters from the student's **Advisory Committee** will serve as the primary letters of reference, and the graduate GPA from formal Master's course work will be taken into consideration.

Progress/Conduct

- 1a. If I am terminated from a degree program due to insufficient progress, misconduct, or any other reason, may I apply for readmission at a later date?

If you are terminated or suspended from the graduate program for any reason and wish to apply for readmission, you must appeal to the Dean of the Graduate School in writing.

- 1b. If I voluntarily resign my position, may I reapply at a later date to be readmitted to the program.

Yes, but you must reapply to both the Graduate School *and* to the Department. The Department's Graduate Student Selection Committee will re-evaluate your application. You must have a faculty member that is willing to serve as your **Major Advisor**.

2. If I am required to take a preliminary examination and fail it, will I be able to take it again?

The preliminary examination is a diagnostic exam to identify your academic deficiencies. You will be asked to take courses as part of your degree plan to make up any such deficiencies.

3. Ph.D. students only: If I fail my Qualifying Examination, will I be able to take it again? If I fail the written part of the Qualifying Examination, can I still take the oral part?

The Qualifying written Exam ordinarily is at least a six hours-long (not necessarily continuous) exam. A Ph.D. student must pass the written part of the Qualifying Examination before he or she is allowed to take the oral part. Passing the written part means that the student's performance must be approved by at least **a majority** of the **Advisory Committee** members. If a Ph.D. student fails to pass either the written part or the oral part of the Qualifying Examination, he or she is allowed to retake the part failed one more time, but only after an interval of at least **four months** and not more than 12 months. Failure to pass the Qualifying Examination a second time will result in dismissal from the doctoral program.

4. Ph.D. students only: If I fail my Qualifying Examination (once or more than once), can I still receive an M.S. degree?

If, after failing the Qualifying Examination, the student wishes to earn a Non-Thesis M.S. degree, he or she must apply to the department for admission to the M.Sc. degree program and, if admitted, form a new **Advisory Committee** at that level. A new degree plan must then be submitted with the approval of the Master's **Advisory Committee** members.

5. If I fail my Final Examination and Defense of thesis or dissertation, will I be able to take it again?

In order to pass the Final examination and Defense of thesis/dissertation, a **majority** of the student's advisor committee members must cast affirmative votes. If a Master's student fails the Final Examination, that is, does not receive majority approval, he or she may be permitted one more opportunity to defend after an interval of at least **four months**. The Graduate School does not normally permit a Ph.D. student to repeat the Final Examination and Defense. However, appeals for final exam decisions are covered under TTU Operating Policy 64.07.

6. Can I complete a degree program successfully without having any teaching experience?

There is no departmental requirement that a graduate student must have teaching experience (e.g., be appointed as a TA) for the completion of any graduate degree. However, it is recommended that students, especially Ph.D. students, obtain at least one year's experience in the classroom. This experience will make the student a much stronger candidate for future academic jobs.