

TEXAS TECH UNIVERSITY

*MASTER OF SCIENCE IN
BIOTECHNOLOGY*

*MASTER OF SCIENCE IN
BIOTECHNOLOGY with RESEARCH
CONCENTRATIONS*

*GRADUATE CERTIFICATES in
BIOTECHNOLOGY*

GRADUATE MINOR IN BIOTECHNOLOGY

*Student
Handbook*

2024/2025

Graduate Advisor's Message

Dear Students:

I, on behalf of Texas Tech, welcome you to this great program and university.

The master's program in the Center for Biotechnology and Genomics offers a great environment for learning. Over the next year(s), our goal is to provide you with the most up-to-date knowledge and training in this area. We are dedicated to making your experience here both enjoyable and productive.

The unique feature of our program is the availability of both research and non-research-based curriculum, wide array of electives, and most importantly to give you the freedom to select the elective courses and research options that meet your needs/interests. I am here to help you select your courses, research areas, and answer any questions you may have.

Our graduates are currently employed in well-known biotechnology industries and academic institutions or are furthering their studies in a doctoral program, medical or dental school. I am confident that you will find yourselves professionally qualified for whatever path you choose in the exciting field of biotechnology.

I present to you the 2024/25 Student's Handbook. It contains essential information and program policies that you must know and follow as a biotechnology graduate student.

Thank you for your decision to join the master's program in the Center for Biotechnology and Genomics. I wish each one of you a great start to the semester.

Good luck in your endeavors!

Jatindra Nath Tripathy, Ph. D; M.B.A.

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We would like to acknowledge The Department of Biological Sciences at Texas Tech University for allowing portions of their graduate student handbook to be used as a model for some of the sections contained in the Biotechnology student handbook.

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MISSION STATEMENT

Biotechnology research is a major focus at Texas Tech University. The Center for Biotechnology and Genomics capitalizes on this strength by facilitating research partnerships between highly productive research teams that extend across departmental boundaries. These partnerships are established to bring together complementary research efforts in biochemistry, molecular biology and genetics, genomics, proteomics, and bioinformatics.

The Center for Biotechnology and Genomics is an integrated component of the international biotechnology and genome research community. We have forged strong cooperative ties with academic institutions, federal laboratories, and biotechnology industries.

The Center provides:

- Core Facilities that offer instrumentation, support and training in various aspects of modern biotechnology: genomics, proteomics, bioinformatics.
- Multidisciplinary graduate studies in Biotechnology with research concentrations in Life Sciences Research and Bioinformatics Research, leading to a Master of Science in Biotechnology, which is designed to prepare students for technical positions in the rapidly growing biotechnology industry.
- Multidisciplinary graduate studies in Biotechnology without research concentrations, leading to a Master of Science in Biotechnology, which is designed for students whose primary career interest is to pursue professional degree programs such as medical school, dental school, veterinary school, business school, law school and career outside of bench-research in the biotech sector.
- A joint MS/JD degree, a program in conjunction with the Texas Tech Law School
- Graduate Certificate in Biotechnology, which is designed primarily to meet the needs of participants who needs short term, specialized training to join the biotech workforce or enhance their career prospects.
- Graduate Minor in Biotechnology, which is designed for students of other majors, who wish to advance their knowledge and expertise in specific areas in biotechnology.

IMPORTANT PROGRAM POLICIES

Students Mentoring

- ✓ Each student will be assigned a mentor at the beginning of the semester. The mentor is a faculty at the CBG.
- ✓ Mentor and mentee should meet periodically to discuss matters related to academic issues: course works, projects, written report, presentation throughout the course of the study.
- ✓ Mentors should keep the Graduate Advisor updated if there is any major concern in students' academic performance.

Diagnostic Test

- ✓ Diagnostic tests will be administered 3 times in an academic year, first one before the start of fall semester, second one after the final exam of fall semester, and third one after the final exam of spring semester.
- ✓ A set of topics for diagnostic preparation is available in the Handbook.
- ✓ The question format is 50 multiple choice questions.
- ✓ The minimum score requirement to clear the diagnostic is 80%.
- ✓ After an unsuccessful attempt, the Graduate Advisor will meet the student and discuss the reasons for failure, and topics they should work on.
- ✓ After three unsuccessful attempts, students who meet the minimum GPA requirement of the Graduate School (3.0) will be advised to take an undergraduate/graduate level course.
- ✓ Students whose GPA is below the minimum 3.0 will no longer be eligible to continue in the graduate program. Rather, students may consider applying for a graduate certificate.

Master's Internship

- ✓ We will help facilitate finding an internship in a biotech industry, academic lab, or federal organization. However, a student must go through the selection process of the hiring organization. Internship stipend depends on the employer.

- ✓ Students are encouraged to join to work with any faculty member; any financial support depends on the availability of funds with the respective faculty.

Master's Thesis

- ✓ Students may choose to start the thesis project from the first semester (fall semester). In that case, the faculty member (the thesis advisor of student) may decide what courses would be appropriate for student to take in their first semester (student may not take all three core courses in the first semester).
- ✓ A student who is on graduate school support must register for three credit hours of research credit (BTEC 7000) in the first semester.

Registration in biotech courses as electives

- ✓ Students who have a minimum GPA as per the graduate school (3.0 and above) will be eligible to register in elective courses. (Note three core courses: BTEC 5301: Introduction to Biotechnology, BTEC 5338: Methods in Biotechnology and BTEC 5322: Bioinformatics Application).
- ✓ The minimum passing grade in any biotech graduate course in the program is "C", otherwise retaking the course is required.

Continuation of financial support (Assistantship, Fellowship, Scholarship)

- ✓ Any financial support (scholarship, fellowship, RA, TA) requires a student to maintain a 3.0 GPA during the tenure of support. Failure to maintain a 3.0 GPA will result in the discontinuation of financial support.

Comprehensive Final Exam

- ✓ A maximum of two attempts are permitted to pass the final exam. The second attempt cannot be in the same semester. After two consecutive unsuccessful attempts, students may consider applying for the biotechnology certificate.

DIAGNOSTIC TEST TOPICS

1. Biomolecules GENERAL STRUCTURE and PRINCIPAL FUNCTION
2. Chemical bonds: Covalent, non-covalent bonds
3. Properties of water, pH, and Buffer
4. Fundamental chemistry, mole, molar, molar solution, percentage solution, stock solution
5. Functional groups in organic molecules, Fischer, and stereo chemical rendering of organic molecules
6. Concept of evolution of gene, Gene definition and Genome concept
7. Gene cloning principle and techniques
8. Protein purification and characterization
9. Concept of Free Energy, Enzyme catalysis and specificity of biochemical reactions and biochemical pathways
10. Prokaryotic and Eukaryotic cell structure, organellar function, cell division
11. Replication, Transcription and Translation in virus, prokaryotes, and eukaryotes
12. RNA types, difference between eukaryotic and prokaryotic RNA
13. PCR, Sanger Sequencing, Agarose gel electrophoresis, and SDS-PAGE
14. Transgenic animals and plants, Techniques involved in genetic modification.
15. Animal models, including non-mammalian models (the fruit fly *Drosophila melanogaster*, the nematode *Caenorhabditis elegans*, the Zebrafish *Danio rerio*), rodent models, large animal models including non-human primates, etc.
16. Basic concepts of bioethics: ethics vs morals
17. Protein Data Bank – 3D visualization and analysis of protein structure
18. Simple sequence alignment questions—BLAST, gaps, alignment score
19. Data types, including text format, databases, spreadsheets, etc.
20. Basic Statistics, including mean, median, average, mode, standard deviations, errors, systematic errors, random errors, etc.

MASTER OF SCIENCE IN BIOTECHNOLOGY: Program Overview

Two Master of Science program: **a one-year (without research concentration), and a two-year (with research concentration) program**, are administered by the Center for Biotechnology and Genomics as part of the Interdisciplinary Programs of the Graduate School of Texas Tech University. These programs are designed to prepare students for careers in biotechnology with advanced specializations in the Life Sciences and Bioinformatics. Students may pursue a 30-credit non-research degree that may be completed in one year, or a 38-credit research-based degree that may be completed in two years.

The 30 credit, non-research degree program provides opportunity for preparation for students who wish to go on to the veterinary school, medical or dental schools, or other biosciences or STEM related professional schools, and wish to pursue a career in the biotech sector but outside of bench-research. It involves neither a research-based thesis nor a research internship, but instead involves additional, advanced course work, chosen in an academic area of concentration like communication studies, nutrition science, informatics/computer science, engineering, microbiology, biochemistry, medical science or business. For example, for students interested in eventually moving into management positions in the Biotechnology industry, a variety of business courses in management and related areas are available. **Planning the courses for this option should be discussed with the Graduate Advisor as early as possible to ensure courses are available for registration.** Class grades, an in-depth written paper and presentation on an appropriate topic in a capstone course and an oral comprehensive final examination will determine success in this track. **Students must register for capstone credit (3 hours) in the capstone course BTEC 5335: Capstone in Biotechnology in their graduating semester.**

The 38 credit, research-based degree program is offered with two research concentrations: the concentrations in Life Sciences Research and the concentration in Bioinformatics Research. Both these research concentrations consist of a 21-month curriculum. Students take courses for **a minimum of 20** credits in the first year, and a total of **18-24** credit hours during the summer sessions and the second year. The program is designed to train students in the most important techniques currently used in the biotechnology sector. In addition, the program provides excellent preparation for students wishing to go on and pursue a Ph.D. degree or MD (Ph.D.) degree after graduation.

The first year of the program (fall and spring) involves only course works. This comprises a combination of required core courses (lectures and laboratory) in the fall semester and selections from a broad spectrum of electives in the spring semester. Students can choose elective courses offered at the center. Students might alternatively, choose **advanced STEM-relevant courses** as elective in other departments at Texas Tech University or the Texas Tech University Health Sciences Center. Additionally, the center might also afford the students the ability to take online or face-to-face courses

outside the TTU educational system, under close supervision from a CBG faculty. Students must obtain the approval of the Graduate Advisor before registration of courses outside of the Center.

The second year of the program involves practical training in a research environment. **There are two options for students pursuing research concentrations in the second year of the program: thesis and internship.** These are highly competitive options with many factors determining availability of and eligibility for these positions. Both these options involve intense (hands-on) practical training, with students choosing between an academic or industry internship or working toward an M.S. thesis.

Option 1 involves a one-year thesis-based research experience in a laboratory at Texas Tech (or, in some cases, at the Texas Tech Health Sciences Center, TTUHSC), under the supervision of a faculty member with scientific expertise in a field of particular interest to the student. This option may take longer than one year to complete, as it depends on the completion of a research project, an oral defense of the research to a **committee of three faculty members** and submission of a written thesis. Students must register research credits, BTEC 7000 (12 hours). In addition, **students must register for Master's thesis (BTEC 6000 - 6 hours) in their graduating semesters.**

Students may choose to start the thesis project from first semester (fall semester). In that case, the faculty member (the thesis advisor of student) should decide what courses the student needs to take (student may not take all three core courses in the first semester).

Student must register for three credit hours of research credit (BTEC 7000) in first semester.

Option 2, which does not involve a written thesis, is a one-year internship. Internships are available in private-sector biotechnology companies, in non-profit research foundation laboratories, in state and federal government research labs, or in selected university labs. Our faculty assist students in finding internships that are interesting and challenging. Students can apply for, and choose any biotechnology company in the U.S. The number of hours students need to register in internship credits depends on the nature and location of internship. Students must register 18 hours of internship credit in case of off-campus internship. All on-campus internship requires minimum of six internship credits (BTEC 6001 - 6 hours) and 12 hours of research credits (BTEC 7000). **Students must register 6 hours of internship credits in their graduating semesters.** Successful completion of internship is evaluated by a written descriptive report and a comprehensive oral examination (including all coursework and experience gained during the internship) by a committee of at least three faculty members.

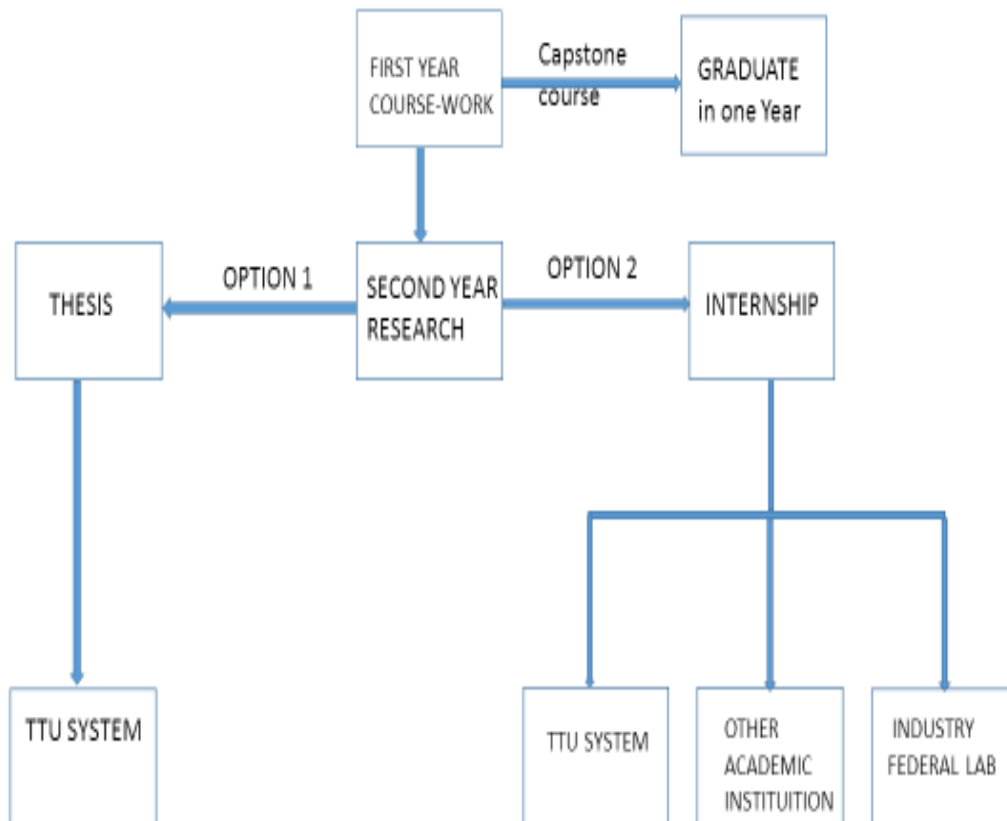
Additionally, a Certificate in Biotechnology is available to cater the needs of people who wants basic training and short-term education to pursue a career in biotechnology. A certificate in biotechnology can be obtained by completing 12 BTEC credits (three core courses, BTEC 5301: Introduction to Biotechnology – 3 credits, BTEC 5338: Methods in

Biotechnology – 3 credits and BTEC 5322: Bioinformatics Application – 3 credits and any other BTEC course of choice as an elective (3 credits).

In addition, a graduate minor in biotechnology (9 credits required) is available for students of other majors. Students can obtain a minor by taking any three BTEC courses offered from the Center.

Master of Science in Biotechnology Curriculum Sketch:

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Curriculum: Master of Science in Biotechnology without Research Concentration – 30 credit hours

First semester (fall), Core Courses – 15 credits

BTEC 5301: Introduction to Biotechnology – 3 credits
BTEC 5338: Methods in Biotechnology – 3 credits
BTEC 5322: Bioinformatics Application – 3 credits
BTEC 5100: Scientific Communication – 1 credit
BTEC 6101: Biotechnology Seminar – 1 credit
BTEC 5001: Topics in Biotechnology: Bioethics -1 credit
Elective 1 – 3 hours

Second semester (spring) – 15 credits (3 credits Capstone and 9 or 12 credits electives)

BTEC 5335: Capstone in Biotechnology – 3 credits (**must register in the graduating semester**)

Any courses from the list below or from the other departments with the approval from the Graduate Advisor.

BTEC 5333: Advanced Bioinformatics – 3 hours
BTEC 5311: Protein Engineering – 3 hours
BTEC 5312: Gene Expression Analysis – 3 hours
BTEC 5313: Experimental Mass Spectrometry in Biotechnology – 3 hours
BTEC 5001: Topics in Biotechnology

Note: 18 hours of BTEC credit required to graduate

Curriculum: Master of Science in Biotechnology with Research Concentrations – 38 credit hours

- I. Concentration in Life Sciences Research
- II. Concentration in Bioinformatics Research

FIRST-YEAR COURSE-WORK – 20 hours

First semester (fall), Core Courses – 11 credits

BTEC 5301: Introduction to Biotechnology – 3 credits
BTEC 5338: Methods in Biotechnology – 3 credits
BTEC 5322: Bioinformatics Application – 3 credits
BTEC 5100: Scientific Communication – 1 credit
BTEC 5001: Topics in Biotechnology: Bioethics -1 credit

Second semester (spring), Electives - 9 credits

Concentration in Life Sciences Research

Any courses from the below elective list or from the other departments with the graduate advisor's approval.

BTEC 5333: Advanced Bioinformatics – 3 hours
BTEC 5311: Protein Engineering – 3 hours
BTEC 5312: Gene Expression Analysis – 3 hours
BTEC 5313: Experimental Mass Spectrometry in Biotechnology – 3 hours
BTEC 5001: Topics in Biotechnology

Second semester (spring), Electives - 9 credits

Concentration in Bioinformatics Research

Must register courses listed below or from the other departments with the graduate advisor's approval.

NS 5342: Biostatistics in Nutrition – 3 hours
BTEC 5333: Advanced Bioinformatics – 3 hours
BTEC 5312: Gene Expression Analysis or BTEC 5313: Experimental Mass Spectrometry in Biotechnology or BTEC 5311: Protein Engineering– 3 hours or Topics in Biotechnology

SECOND-YEAR RESEARCH – 18 hours

Third semester

Full Summer or Summer I and Summer II – 9 hours

BTEC 7000: Research in Biotechnology – 9 hours

Fourth semester

Fall

BTEC 7000: Research in Biotechnology – 3hours
BTEC 6001: Biotechnology Internship or BTEC 6000 master's Thesis – 6 hours

OR

BTEC 7000: Research in Biotechnology – 9 hours

Fifth semester (spring) – 9 hours

BTEC 7000: Research in Biotechnology – 3 hours

BTEC 6001: Biotechnology Internship OR BTEC 6000 master's Thesis – 6 hours

Curriculum: Graduate Certificate in Biotechnology – 12 credits

Required Courses – 9 credits.

BTEC 5301: Introduction to Biotechnology – 3 credits

BTEC 5338: Methods in Biotechnology – 3 credits

BTEC 5322: Bioinformatics Application – 3 credits

One more BTEC course as elective – 3 credits

Curriculum: Graduate Minor in Biotechnology – 9 hours

Any three BTEC courses offered from the Center.

IMPORTANT PROGRAM ACTIVITIES

I. First-Year Activities

A. Biotechnology Graduate Student Orientation

The orientation is arranged before start of the class in every fall semester to orient new students with the graduate school and program policies. It is a required one-day event for both degree seeking and certificate students. The Director of the Center, the Graduate Advisor, faculty, staff, and current graduate students assemble to welcome the incoming graduate students. Speakers from the Career Center, Environmental Health & Safety, Office of Research and Innovation, Biotechnology Student Organization address new students. The Graduate Advisor discusses the program policy and curriculum in detail.

Attendance is mandatory.

B. Diagnostic Tests

All degree-seeking students, both one-year and two-year program, are required to take the diagnostic test before the first day of the class. After that, two diagnostic tests will be administered, at the end of the first semester (fall) and during second semester (spring). The date and time will be communicated to the students in advance. Students should score minimum 80% to pass the diagnostic test in any of their attempts. Maximum of **three attempts** to pass the diagnostic tests are allowed. **If students are unsuccessful after the third attempt but have a minimum GPA of 3.0 would be advised for further remedial courses. They should score a minimum “B” in the remedial courses to continue the program. Students whose GPA is below 3.0 will not be eligible to continue in the program. In that point, students may consider the option of getting a Certificate in Biotechnology.**

C. Responsible Academic Conduct Training

All degree-seeking students, both one-year and two-year program are required to complete this online training within their first semester of enrollment. The training is accessible at <https://go.grad.ttu.edu/rcr>

D. Capstone Project, Presentation, Report and Final Comprehensive Examination (non-research, one-year degree program)

Students in one-year program will give the final oral presentation of their **capstone project** to an open audience of peers and committee members. They will also take an oral comprehensive examination and produce a written report of the project. A committee will evaluate students' performance in all three aspects: Oral presentation, written report, and comprehensive oral examination. Students must score 80% or above in each above category to pass the examination.

II. Second-Year Activities (Research concentrations only)

A. Research Symposium

Students pursuing research concentrations are required to present their progress of work done in their internship or thesis projects at the research appraisal seminar at the end of the third semester (around mid-December). They are also required to submit a written report of their project(s) in the following format: literature, goals, objectives, hypothesis, results, and future work to the graduate advisor at least three weeks before presentation. All CBG faculty will evaluate both report and presentation according to a rubric. A score of 80% or above is considered a good performance by the student. Feedback will be provided to both the students and mentor about the students' performance.

B. Graduate School Poster Competition

All graduate students are encouraged to participate in the Graduate School Annual Poster Competition in April. The Graduate School and the Graduate Advisor will provide the information about the competition well in advance to students.

C. Final oral Comprehensive Examination, Presentation, written Report and Thesis

Students will give the final oral presentation of their **research project leading to thesis or internship** to an open audience of peers and committee members. They will also take an oral comprehensive examination (internship option only) and produce a written report (a thesis in the case of a thesis option). Students doing a thesis need to write a thesis according to the graduate school guidelines. Students will be assessed for the quality of their presentation of experimental or informatics-related results, written reports and demonstration of successful integration of transferrable skills and knowledge. Students must score 80% or above to pass the comprehensive examination.

IMPORTANT PROGRAM INFORMATION

I. 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. **No course in which a grade of “D” or “F” is received can be used for credit towards the degree.**

A student who fails to maintain a cumulative graduate GPA of 3.0 will be placed on academic probation for failing to meet the satisfactory progress requirements for graduate education at Texas Tech University. **The student is required to raise the GPA to at least 3.0 in the next regular semester** (both summer sessions count as one regular semesters). **Failure to do so will result to academic suspension.** According to the TTU policy, students placed on suspension are required to remain out of the Graduate School for at least one semester and student must reapply to the graduate program. The admission to the program is not automatic. The admission committee will review student’s application and take decision for readmission. The policy of the Graduate School states that if a student is suspended twice, the student will not be allowed to return to the Graduate School.

Students should discuss with the Graduate Advisor about course(s) that is suitable for them to register. **Only stem-relevant courses are allowed to take to raise the GPA.** Most importantly, students are not allowed to take advanced elective courses until the GPA is raised to 3.0.

At the end of the 1st semester (usually in December-January) and again after the 1st year (usually in May), **all graduate students are required to meet with the Graduate advisor** to discuss various aspects of their progress toward the completion of their degrees. The advisor will use these meetings 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 will be referred to the Director of the Center for review and loss of scholarship, teaching and research assistantship opportunities or dismissal from the graduate program.

II. Deadlines and Time Limit

Although the Graduate Advisor will make every effort to make the student aware of various University and Department regulations and deadlines, **it is the student’s responsibility to see that these regulations are adhered to and that the deadlines are met (see the checklists on pg.22-25).** All work applied towards a master’s degree must be completed in a timely manner.

III. Degree Works (<https://degreeworks.texastech.edu/dashboard>)

Degree Works is the online repository of degree related course works. Students should use this site as a tool to monitor the progress of their degree program from the beginning until the graduation.

IV. 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 website](#) should be consulted.

V. Maximum Allowable Graduate Hours

Graduate students who are not making timely progress toward completion of their degree and whose cumulative GPA is below 3.0 are subject to probation for the following semester and suspension afterwards by the Dean of the Graduate School. Students beyond the maximum allowable graduate hours may be required to pay out-of-state tuition, regardless of residence status. The maximum time allowed for completing a master’s degree is six years.

VI. Enrollment

Timely graduation requires students to register for appropriate courses and correct credit hours in **every** semester. Full-time graduate students must enroll minimum 9 credits in the fall and spring and 3 credits in each summer session to be eligible for fellowships, assistantships (TA, RA, GPTI) and scholarships. Students receiving financial assistance must register for the number of hours required by Financial Aid.

VII. Competitive Scholarship

To maintain the eligibility of competitive scholarship or any TTU assistantships, graduate students must pass the diagnostic test, maintain an overall GPA of 3.0 and a final grade point average of B or higher in all required and elective courses during the first year of the program. Scholarships from external sources have their own policy requirements. It is the responsibility of the student to be aware of, and comply with, these policies. Any deviation from these rules is at the discretion of the Graduate Advisor.

PROGRAMS in DETAIL

I. Master of Science in Biotechnology without Research Concentration

A. Fall (1st semester)

To graduate in a year, students should register for the following courses (15 credit hours) in the first semester. Failure to take courses might result the delay of graduation as some of these courses are only offered in the fall semester. **BTEC 5301: Introduction to Biotechnology, BTEC 5338: Methods in Biotechnology, BTEC 5322: Bioinformatics Application, BTEC 5100: Scientific Communication, BTEC 6101 Biotechnology Seminar, CHEM 5104 Lab Safety and Responsible Conduct of Research, and a 3-hours elective course** are required courses for the first fall semester of enrollment in the non-research based graduate program.

Students might take a second elective in the place of BTEC 5322: Bioinformatics Application, which can be taken in the spring.

B. Spring (2nd semester)

Students need to enroll 15 hours (12 hours electives), including 3-hours capstone course, **BTEC 5335: Capstone in Biotechnology**. Students must register in the Capstone course in the graduating semester. Students can choose from following list of courses offered in the Center. **BTEC 5312: Gene Expression Analysis, BTEC 5313: Experimental Mass Spectrometry in Biotechnology, BTEC 5311: Protein Engineering and BTEC 5333: Advanced Bioinformatics**. Additionally, Students can also choose courses offered in other colleges at TTU and TTUHSC with the permission from the Graduate Advisor, such as courses from media and communication, nutrition sciences, animal sciences, computer sciences, biology, chemistry, plant and soil sciences, courses offered at medical school and business school as electives.

- **Capstone Course:** Students pursuing M.S. degree without research concentration MUST register in **BTEC 5335: Capstone in Biotechnology** in their graduating semester. The course serves as the degree capstone course and is mandatory for the graduate students pursuing one-year M.S. program in Biotechnology. The course prepares students to integrate the skills and knowledge learned from their coursework to help synthesize new concepts and innovate innovative ideas, products and processes to meet the demand of global challenges.

At the end of the first year (Fall and Spring semesters), students must complete 30 credit hours of academic course work, **out of which 18 credits must be BTEC courses**, with a cumulative **GPA of 3.0 or greater**, and **pass the diagnostic test in** order to graduate in one year. In addition, students must give a final comprehensive oral examination, must submit a written report, and must give an oral presentation of his/her capstone project.

The format of the final presentation and oral examination is like the students pursuing internship options.

II. Master of Science in Biotechnology with Research Concentrations

A. First Year - Fall (1st semester)

BTEC 5338: Methods in Biotechnology, BTEC 5301: Introduction to Biotechnology, BTEC 5322: Bioinformatics Application, BTEC 5100: Scientific Communication and CHEM 5104: Lab Safety and Responsible Conduct of Research are required courses for the first fall semester of enrollment in the graduate program. Failure to take a course at the appropriate time might result in delay in graduation, the loss of opportunities for internships and assistantships, and dismissal of the student from the program. Exceptions to this schedule must be discussed and approved by the Graduate Advisor in advance. **In addition** to these courses, students may take one elective with the prior permission from the Graduate Advisor. Students must register for a minimum of **11 credit hours** of required courses in the fall semester.

Leveling courses. Incoming graduate students with educational gaps in their background may be required to take certain courses to fill these gaps. However, these courses cannot be used to satisfy degree requirements.

B. First Year - Spring (2nd semester)

Fulltime graduate students must register for a minimum of **9 credit hours** in the spring semester. (Taking an elective in the fall semester over the required 11 hours course load is optional, but the total formal course workload must total a minimum of 20 credits.) Exceptions to this schedule must be discussed and approved by the Graduate Advisor in advance.

Students can choose 3 electives (9 hours) from following list of courses offered in the Center. **BTEC 5312: Gene Expression Analysis, BTEC 5313: Experimental Mass Spectrometry in Biotechnology, BTEC 5311: Protein Engineering and BTEC 5333: Advanced Bioinformatics.** Students can also choose courses offered in other colleges at TTU and TTUHSC with the permission from the Graduate Advisor.

Students pursuing the bioinformatics track must enroll in **BTEC 5333: Advanced Bioinformatics and NS 5342: Biostatistics in Nutrition.** In addition to that, students may choose one of the following courses to meet the requirement of third electives: **BTEC 5312: Gene Expression Analysis, BTEC 5313: Experimental Mass Spectrometry in Biotechnology, and BTEC 5311: Protein Engineering.** Students can also choose courses offered in other colleges at TTU and TTUHSC with the permission from the Graduate Advisor.

At the end of the first year (Fall and Spring semesters), students must complete a **minimum of 20 credit hours of academic course work** and **must have a cumulative GPA of 3.0 or greater** and **must pass the diagnostic tests** in order to be considered for the second year research/internship program. Any exceptions, if the circumstances warrant, are at the discretion of the Graduate Advisor and requires specific approval.

Adequate academic preparation is absolutely required for an intensive second year research experience and all internships (internal or industrial) and thesis projects must be approved by the Graduate Advisor.

Summer I and Summer II is an optional period for students to do any course work or start second year research early. Registration in summer is only required in certain circumstances. Consult with the Graduate Advisor if you want to know any information about summer registration.

C. Second Year - Third (Fall) and Fourth (Spring) Semesters

The program offers students the opportunity to carry out two-semester of research activity in the second year. Students have a choice between doing a **non-thesis internship** project or a **thesis-based research project**.

- **Non-Thesis Master's Program (Internship Option):** The non-thesis master's degree program in Biotechnology is designed to make a substantial contribution to the intellectual and technical development of the student. The internship option is designed for students whose career plans are best served by research experience in either industry or academic lab and which do not require a written thesis as part of the training experience. To earn the non-thesis master's degree, the student must complete **at least 38** hours of course credit beyond the Bachelor's degree. An internship may be pursued after successfully completing **20 credit hours** of course work in the first year followed by **18 hours of** combined research and internship credits. **Students doing an internship in a lab at Texas Tech System should register 9 hours in BTEC 7000: Research in Biotechnology in the fall, 3 hours in BTEC 7000: Research in Biotechnology and 6 hours in BTEC 6001: Biotechnology Internship in the spring semester. Students doing internships outside the academic campus should register 9 hours in BTEC 6001: Biotechnology Internship in both the fall and spring semester. Any deviation from the above needs the prior approval from the Graduate Advisor.**
- **Evaluation of Internship Project:** Students' project will be evaluated by the committee of three members, typically a combination of the Graduate Advisor (chair of the committee), and two faculty members from the CBG or the mentor from the lab where the internship is being done. A student's internship experience will be evaluated by a written report, oral presentation and a comprehensive final exam.
 - **Written Report:** In consultation with his or her mentor, student will write a summary of the internship experience. Generally, a document of 20 pages in length is sufficient. Details and information on the format may be obtained from the Graduate Advisor. Students must submit the written portion of the exam (internship report) to all members of the Examination Committee at **least two weeks before** the scheduled date for the oral

presentation. The report should be approved by his/her mentor before it is submitted to the Graduate Advisor. A bound copy of the report is due after any corrections suggested by the committee.

- **Oral Presentation:** Student will then make an oral presentation of research project, which is open to the public, describing his/her experience and presenting his/her work to the Advisory Committee and all in attendance. The final oral comprehensive examination (see below) typically follows immediately after presentation.

- **Final Comprehensive Oral Examination:** Each non-thesis master's student must pass a final oral comprehensive examination before earning a Master's degree. This exam is based both on the student's course work and on research project leading to internship. Students should be aware that 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 website](#) for the exact date, which varies somewhat from one year to another). The date for the examination will be set after discussion between the student and all members of the Examination Committee, keeping in mind the Graduate School deadline. The student's Examination Committee administers the final oral examination. The Committee members will use the 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 course work, readings and internship experiences. The student is expected to deliver responses that are concise and well-reasoned. As soon as possible after the examination, the head of the Committee 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 may retake the exam in another semester. Students cannot take more than one oral examination in same semester.** In the event of failure, the Committee will provide the student with a summary of the perceived deficiencies and corrective actions that need to be taken before making the second attempt. Students should also understand that faculty members might not be available for an examination during the summer.

- **Master's Program (Thesis Option):** The thesis master's degree option in Biotechnology is recommended for most students interested in a career in science that involves independent research. Participation in thesis research provides sophistication and insight into the workings of science beyond that available in formal course work, facilitates the eventual pursuit of doctoral studies, and may enhance employability through development of research skills. The student must complete at least **38 hours** of course credit beyond the bachelor's degree, 18 hours in the second year, **6** hours of which must be thesis research. At least **20 hours** are required in academic course work.

- **Advisory Committee:** Typically, during the student's first summer session after the completion of all required coursework, but no **later than the first semester of the second year** 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** (occasionally more) Graduate Faculty members, one of them being the Major Advisor who will serve as the Chairperson of the Committee. The Advisory Committee will advise the student and assess his or her progress towards the master's degree. The Committee approves the thesis research proposal and conducts the final oral defense of the thesis.

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

- 1) In the case of a proposed change other than the Major Advisor, the process is initiated by the Major Advisor. **The Graduate Advisor must be informed of the change.** The student must also show courtesy to the Committee member being replaced by letting him or her know about the plans for change and reasons for the decision. It may be that a misunderstanding has occurred that can be resolved, so that a change will not be necessary.
 - 2) A student proposing to change his or her Major Advisor should inform the current Major Advisor directly or through the Graduate Advisor of the Center. In either case, the Major Advisor will be given an opportunity to express his or her opinion and try to work out problems that may have precipitated the need for such a change. Some discussion with the Director of the Center may be required before a final decision is reached.
 - 3) In extreme cases of disagreement, the Major Advisor or Committee member has the right to file an official grievance, which will be conducted according to normal grievance policies of Texas Tech University.
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- **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 website](#). After being approved by the Major Advisor, a complete version of the thesis (not

necessarily the final one) will be given to all other members of the Advisory Committee at least **four weeks** prior to the anticipated date of the thesis defense. 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 can 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 Director of the Center.

- **Defense of Thesis:** Before earning the M.S. degree, each thesis master’s student must complete the defense of thesis. After the Advisory Committee has judged that the thesis is in a defensible form, the graduate student may then formalize and announce the date for the 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 have completed and be ready to turn in to the Graduate School 1). the final, Committee-approved copy of the thesis; 2). signed Thesis-Dissertation Approval Form; 3). and the Electronic Thesis-Dissertation (ETD) Signature Form within **two weeks** of the defense or **no later than the date** in the “Graduation Deadlines” posted on the [Graduate School website](#). 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. Student should submit a hardbound copy of the thesis to the center after the thesis is officially accepted by the university.

The 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 the following question-and-answer session is open to all faculty, graduate students and others who wish 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. As soon as possible after the 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 defense may repeat it**

once, but only after an interval determined by the committee. In the event of failure, the Major Advisor will provide the student with a summary of the perceived deficiencies and corrective actions that need to be taken before making the second attempt.

M.S. CHECKLIST- CAPSTONE PROJECT

Students are responsible for ensuring that all deadlines are met.

For the purposes of this program, your Major Advisor is the Graduate Advisor, Dr. J.N. Tripathy.

Activity	Typical Date or Deadline
New Students Orientation	Week before class begins in the fall
First Diagnostic Test	Before class begins in the fall
First Semester Coursework: 15 hours BTEC 5301, BTEC 5338, BTEC 5322, BTEC 5100, BTEC 6101, CHEM 5104, and one elective (3 hours)	Week before classes begin in the fall
Second Diagnostic Test	After first semester (Dec or Jan)
Second Semester: 15 hours Meet with Graduate Advisor to discuss degree plan and to plan courses for second semester.	After the first semester, usually in December or January
Third Diagnostic Test	During/after second Semester (May/June)
Meet with Graduate Advisor to discuss about Capstone Project.	After the first semester, usually in December or January
File “Statement of Intention to Graduate” at the Graduate School and make sure all fees are paid.	During the semester of graduation (exact deadline varies)
Capstone project report, final oral presentation and comprehensive oral examination	During the semester of graduation (exact deadline varies) at least three weeks in advance
Graduation	Target: one year

M.S. CHECKLIST- INTERNSHIP

Students are responsible for ensuring that all deadlines are met.

For the purposes of this program, your Major Advisor is the Graduate Advisor, Dr. J. N. Tripathy.

Activity	Typical Date or Deadline
New Students Orientation	Week before classes begin in the fall
First Diagnostic Test	Before class begins in the fall
First Semester Required Courses: 11 hours BTEC 5301, BTEC 5338, BTEC 5322, BTEC 5100, CHEM 5104	Week before class begins in the fall
Second Diagnostic Test	After first semester (Dec or Jan)
Second Semester Elective Courses: 9 hours	After first semester, usually in December or January
Third Diagnostic Test	During/After Second Semester (May/June)
Second Year Program: 18 hours Internship (9 hours in fall and 9 hours in spring)	After successful completion of first year program, usually in May
Internship Placement	Summer/fall
Research Symposium (Second Year)	Last week of the fall semester, Dec
Graduate School Poster Competition	April, second year
File “Statement of Intention to Graduate” at the Graduate School and make sure all fees are paid.	During the semester of graduation (exact deadline varies)
Internship project report, final oral presentation and comprehensive oral examination	During the semester of graduation (exact deadline varies) at least three weeks in advance.
Graduation	Target: Two years

M.S. CHECKLIST- THESIS

Students are responsible for meeting all deadlines and submitting required documents to the graduate school.

For the purposes of this program, your initial Major Advisor is the Graduate Advisor, Dr. J. N. Tripathy.

Activity	Typical Date or Deadline
New Students Orientation	Week before classes begin in the fall
First Diagnostic Test	Before class begins in the fall semester
First Semester Required Courses: 11 hours BTEC 5301, BTEC 5338, BTEC 5322, BTEC 5100, CHEM 5104	Week before class begins in the fall
Second Diagnostic Test	After first semester (Dec or Jan)
Second Semester Elective Courses: 9 hours	After the first semester, usually in December or January
Third Diagnostic Test	During/after second semester (May/June)
Second Year Program: 18 hours Fall Research 9 hours; Spring Research 3 hours, Thesis 6 hours	After successful completion of first year program, usually in May
Meet with Graduate Advisor to discuss about thesis requirements	After the successful completion of first year, usually in May
Set up and meet with Thesis Committee	During the fall semester, second year
Research Symposium (second year)	Last week of fall semester, Dec
Graduate School Poster Competition	April, second year
File “Statement of Intention to Graduate” at the Graduate School	During the semester of graduation (exact deadline varies)

Pay Electronic Thesis Dissertation (ETD) processing fee	During the semester of graduation (exact deadline varies)
Submit a completed version of the thesis to all Advisory Committee members for review	At least four 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)
Defense of Thesis (Major Advisor reports the result to the Graduate School)	During the semester of graduation (exact deadline varies) and scheduled at least three weeks in advance
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) within two weeks of the defense
Upload corrected, final version of thesis to the ETD Submission website	During the semester of graduation (exact deadline varies)
Graduation	Target: Two years

UNIVERSITY POLICY

With permission of the Provost's Office, the statements below were taken directly from the Texas Tech University Faculty Handbook which can be found online at <http://www.depts.ttu.edu/officialpublications/pdfs/2010-11%20Faculty%20Handbook.pdf>

Important Documents

- Student affairs handbook
<http://www.depts.ttu.edu/dos/handbook/>
- Undergraduate and Graduate Catalog (University catalog)
<http://www.depts.ttu.edu/officialpublications/>
- TTU Operating procedures.
<http://www.depts.ttu.edu/opmanual/>

Academic Freedom

“Institutions of higher education exist for the common good. The common good depends upon a free search for truth and its free expression. Hence, the faculty member must be free to pursue scholarly inquiry without undue restriction and to voice and publish conclusions concerning the significance of evidence considered relevant. The faculty member must be free from the corrosive fear that others, inside or outside the university community, because of their differing view, may threaten the faculty member's professional career or the material benefits accruing from it.

Each faculty member is entitled to full freedom in the classroom in discussing the subject taught. Each faculty member is also a citizen of the nation, state, and community, and when speaking, writing, or acting as an individual citizen, must be free from institutional censorship or discipline”.

Academic Integrity

The University is strongly committed to upholding standards of academic integrity. Any student found to have committed academic misconduct is subject to the disciplinary sanctions, conditions, and/or restrictions outlined in Part IX, Code of Student Conduct, Section B of the *Student Affairs Handbook*. This includes (but is not limited to): cheating, plagiarism, academic dishonesty, intoxication, drug possession, theft, possession of weapons, physical harm or threat, disruptive behavior, gambling, hazing, harassment, false alarms, terrorism, financial irresponsibility misuse of computer facilities, providing false information or abuse of the discipline system. Complete definitions and examples of academic misconduct are available in the Texas Tech University Faculty Handbook.

Academic Regulations

Regulations concerning admission, registration, grading practices, class attendance, the University calendar, and other similar matters are stated in the current Undergraduate and Graduate Catalogs. Faculty members are advised to consult the catalogs to become

familiar with those regulations. Information concerning admission of graduate students is mentioned in the current Graduate Catalog. Additional information may be distributed as needed by memoranda or letters.

Americans With Disabilities Act (ADA)

“Section 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) require that universities, and all faculty and staff therein, make reasonable accommodation for all students with disabilities in all programs and activities, both academic and nonacademic. *If such reasonable accommodation is denied to any disabled student, the institution may be held in violation of the law.* It is advisable that you ask in each first-class session that students with disabilities or health problems identify themselves to you (privately after class or during your office hours) and indicate to you any special accommodations you will need to make for them during the semester (for example, extended time examinations). While disabled students are always told to notify their professors, some may be reluctant to do so.

Faculty are not obligated to provide accommodation for a student’s disability needs unless the student provides proof of a disability for which the accommodation requested is appropriate. While such proof should ideally be provided at the beginning of the semester, accommodation requests can be submitted at any time during a semester. The accommodations begin on the date the letter is signed by both the instructor and the student and are NOT retroactive. The university-approved mechanism for doing so is written notification from AccessTECH—a Letter of Accommodation (LOA). The LOA on official university letterhead indicates to professors that the student has given proof of his or her disability and that the accommodation noted is considered appropriate and reasonable. No further proof of disability should be required of the student. Students presenting verification other than the LOA should be referred to AccessTECH in the office of the Dean of Students for the appropriate identification. No requirement exists that accommodation be made prior to completion of the approved university process.

Faculty should be aware of the related student grievance process as detailed in the *Student Affairs Handbook*. It is our hope that this system will enable faculty and staff to easily and quickly access those resources necessary to respond effectively to these students’ needs, particularly those students whose disabilities are not visible or as familiar as others. AccessTECH is available to advise and assist faculty members in the accommodation process. They can be reached at 742-2405.

Keep in mind that the purpose of classroom accommodation is to eliminate the competitive disadvantage caused by the disability itself. *Students with disabilities should be expected to do the same quality of work and the same quantity of work as every other student. It is the method by which this is accomplished that is sometimes different.*

Class Excuses from Student Health Services

Student Health Services is a primary care clinic staffed with licensed physicians and other health care professionals who provide care for minor illnesses, injuries, and mental health issues. Students pay a medical services fee which entitles them to access clinical and pharmacy services at Student Health Services. A valid Texas Tech ID is required to access the clinic services. Student Health Services is in the Student Wellness Center at the corner of Main and Flint on the west side of the campus. Services are available by

appointment by calling (806) 743-2848. Appointment hours are 8:00 a.m. to 5:00 p.m. weekdays. Students are not given excuses for missed classes or exams due to a clinic visit. Students experiencing a lengthy illness that may affect their academic performance may consult their Student Health Services physician about obtaining a letter explaining the situation. In accordance with state and federal law, a student's medical information is confidential and cannot be released to anyone, including parents/guardians, without the student's written permission, unless otherwise authorized by law. Contact Student Health Services at (806) 743-2848 or visit their website at <http://www.depts.ttu.edu/studenthealth/>

Faculty–Student Conflict of Interest

The university is responsible for ensuring the integrity of the roles of faculty and students during the period of graduate or undergraduate enrollment and protecting them from conflict of interest. Faculty must avoid academic supervisory, teaching, or evaluative relationships with students that pose significant conflicts of interest from the standpoint of personal or professional connections. Such connections might include husband-wife or other affectional liaisons, supervisor-employee relationships, or parent-child relationships. The appearance of conflict of interest should be avoided. OP 32.33 sets forth details of procedures that are to be followed in this regard.

Sexual Harassment

"It is the policy of the university to maintain a workplace and a learning environment free of sexual harassment and intimidation. Harassment of students based on sex is a violation of Section 106.31 of Title IX of the Education Amendments of 1972.

Harassment of Texas Tech University employees based on sex is a violation of Section 703 of Title VII of the Civil Rights Act of 1964 and the Texas Commission on Human Rights Act. Sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when:

- Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment, participation in a university-sponsored educational program or activity, or in return for a grade or other consideration.
- Submission to or rejection of such conduct by an individual is used as the basis for an academic or employment decision affecting such individual; or
- Such conduct has the purpose or effect of unreasonably interfering with an individual's academic or work performance or of creating an intimidating, hostile, or offensive working or educational environment.

Any faculty member, staff member, or student may pursue a grievance within the procedures outlined in OP 10.09 without fear of reprisal, stigma, or threats if a complaint is filed in good faith."

Complaint Procedures - Students

Sexual harassment complaints must be filed within 180 days after the incident occurs. (Title VII of *Civil Rights Act* of 1964 and Title IX of the *Educational Amendments* of 1972).

Students believing, they are the targets of sexual harassment in the academic environment

by faculty, staff, or other students should report their complaint to the *Dean of Students Office (DOS)*.

Students complaining of sexual harassment in their employment capacity should proceed directly to the *Affirmative Action Office* as provided in the Faculty and Staff section of this policy.

When a signed complaint is filed, an investigation will be conducted by either the *Dean of Students Office* or the *Affirmative Action Office*. Investigation of a complaint of sexual harassment will include, but not be limited to, conferring with the complainant, the accused and the supervisor of the accused and may also involve examination of relevant documentation and interviews with other pertinent individuals. The appropriate Vice President or Provost will be notified of the complaint.

The investigation will be conducted as quickly as possible and the results reported to the complainant, accused, and the appropriate vice president and Provost.

In the event the complaint is valid, the accused will be subject to disciplinary action, as determined by the appropriate Vice President or Provost.

Appeals by either party may be directed to the appropriate Vice President or Provost.

Conduct of Graduate Students Serving as Faculty (Teaching Assistants)

Graduate students appointed as Teaching Assistants or Research Assistants serve in a limited role as faculty of Texas Tech University. As faculty employees, OP 33.04, *“Conduct of University Faculty*, “and OP 32.33 *“Faculty and Student Conflict of Interest”* apply fully. This policy prohibits actions by a faculty employee which are a breach of the public trust. Penalties for such actions range from an oral reprimand to separation from the University. The classes of actions prohibited are as follows.

1. Academic dishonesty of any form, including but not limited to academic plagiarism or giving improper aid to a student on an examination or grade. Acceptance of money, gifts, or favors from students, or solicitation thereof, which would compromise integrity, are similarly prohibited.
2. Forgery, alteration, or unauthorized use of university documents or records.
3. Knowingly furnishing false information to the University.
4. Use of force or violence or other methods of obstructing the teaching, research, administration, or public service functions of the University.
5. Physical abuse, threats, or conduct dangerous to the health and safety of any person on university property or University-sponsored or supervised functions.
6. Sexual harassment connected in any way to the performance of university duties.
7. Theft or damage to the property of the University or to the property of a member of or visitor to the University.
8. Unauthorized entry to or use of university facilities.
9. Use, possession, or distribution of narcotics or other substances controlled by Federal and State law, except in strict compliance with such regulations.

10. Lewd, indecent, or obscene conduct on university-owned or controlled property or at a university-sponsored or supervised function.
11. Failure to comply with the lawful directions of university officials acting in the performance of their duties.
12. Violation of other promulgated University policies or rules. This prohibition includes failure to meet regularly scheduled classes or to administer scheduled examinations.

The foregoing is to be understood as illustrative, but not exhaustive, of the possible infractions of academic ethics.

Definition of Student Employment

A student employee performs part-time work incidental to academic training in an occupational category that requires all incumbents to be students as a condition of employment. These include:

- A. Graduate Assistant—A graduate student in an institution of higher education employed to perform work which utilizes knowledge beyond undergraduate academic studies. The position of Graduate Assistant is intended for graduate students employed in capacities other than teaching or research.
- B. Research Assistant—A graduate student in an institution of higher education employed in support of the research mission of the unit, its director or faculty, in laboratory, library, field, or computer, or such other activities as may assist the unit's research effort. The position of Research Assistant is intended for graduate students employed in research activities on research accounts.
- C. Teaching Assistant—A graduate student in an institution of higher education employed in support of the teaching mission of the unit who is responsible for, or in charge of a class or class section, or a quiz drill or laboratory section. The position of Teaching Assistant is intended for graduate students employed in teaching activities. The source of funds is ordinarily an academic account.

Disposition by the Dean of Students or Designee

A written report of any disciplinary action taken by the *Dean of Students* or designee will be sent to the appropriate academic dean and to the student. The results of a grade appeal shall be reported to the instructor by the appropriate academic dean in the manner required by the grade appeals procedure (*Part V of the Student Affairs Handbook*).

Grade Appeal Procedure

The *Grade Appeal Procedure* (Part V of the *Student Affairs Handbook*) may be used to appeal a failing course grade, but not a failing grade given for a class assignment. The disciplinary penalty of a grade of *F* shall not be implemented until the disciplinary procedures or grade appeal process has been exhausted. A student may continue the academic class and course work until a final decision is made.

Instructor Responsibilities

The instructor in a course is responsible for initiating action in cases where there is an

admitted act or convincing evidence of academic misconduct. Before taking such action, the instructor should attempt to discuss the matter with the student. If the alleged misconduct involves a final exam, the instructor may withhold the grade until a reasonable attempt can be made to contact the student after the end of the semester.

Instructor Sanctions

If academic misconduct is determined by the instructor, a failing grade shall be assigned to either the assignment in question or to the course grade. When a student is given a failing grade in a course because of academic misconduct, the instructor shall report in writing to the instructor's department chair the facts of the case and the action to be taken against the student. The chair shall provide a copy to the student, to his or her academic dean (and the Graduate Dean in the case of graduate students) and to the Dean of Students.

Plagiarism

This violation includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

Posting Grades

Student grades are not to be posted in any public location. However, with exceptionally large classes, the University recommends that grades be posted as random numbers. These numbers must be the sole property and knowledge of the individual student for that exam posting. This is the University Administration's policy based on legal action taken against instructors, teaching assistants and administrators. If your grades are posted in a manner that places you and the Department in jeopardy, they will be removed.

When possible, return the student's quizzes during the laboratory period. DO NOT place the quizzes outside the lab on the floor or on the wall. DO NOT give a student's scores over the telephone unless you are sure that you are talking to the student; the student's parents or legal guardians are NOT exceptions.

Referrals to the Dean of Students

A student referred to the *Dean of Students* for alleged violation of academic misconduct is entitled to all substantive and procedural guarantees provided in the *Code of Student Conduct*.

Repeated Academic Dishonesty

In cases of repeated violations, either the instructor (through his or her department chair and/or academic dean) or the academic dean may refer the case to the *Dean of Students* for further disciplinary proceeding.

Smoking

OP78.16 prohibits smoking in all campus facilities.

Teaching Assistants (Considerations and Advice)

GENERAL INSTRUCTIONS FOR TEACHING ASSISTANTS

The purpose of your teaching assistantship is twofold: to help support you financially during your study for an advance degree and, of equal importance, to provide an essential service to the Department and to the University. You have been appointed to a responsible job which will have an impact upon the learning experience of many college students. There is so little time for orientation prior to the beginning of the semester, the following points are provided as a guide to help you get started.

1. A good instructor always meets his/her laboratories on time, stays in lab for the entire period, and is well prepared in advance to cover the material for that laboratory.
2. You are encouraged to be innovative and to use your own experiences whenever possible. Remember, a positive approach is most effective, and the course in which you teach is a team effort with the other TA's and the lecturer(s) in the course. It is counterproductive to your effectiveness as a teacher to make derogatory remarks to the students about any aspects of the course.
3. If it is unavoidable that you be absent from a lab period, be sure to check in with your coordinator (or leave a message), and make sure someone covers your lab duties. It is University policy that leaves from "campus" must have proper approval in advance. If you know you are going to be absent for any other reason, apply for official leave.
4. Please use good judgment in your personal habits, hygiene, and dress. If your personal habits are such that they affect the students, someone will discuss the matter with you. What you wear is certainly up to you, but what you wear to a teaching laboratory is the Department's concern, so dress appropriately.
5. Treat all students with courtesy and fairness. To avoid even the appearance of favoritism, do not fraternize unduly with students assigned to your laboratories. It is unethical for you to date a student assigned to your laboratory. Such action would constitute basis for termination of further financial support from the Department.
6. Make every effort to be available to your students. However, do not give out personal cell phone numbers. Students can leave a general message in the main office, ESB Rm. 101.
7. Your duties may include the proctoring of lectures and final exams. Contact the lecture instructor early in the semester to find out what needs to be done and help get the materials to the examination room.
8. Please do your part to protect supplies and equipment from theft and to prevent damage to the building. It is difficult, and sometimes impossible, to replace items that "disappear".
9. Sometimes you may be asked to help clean, organize, or conduct inventories. Consider it part of your job.

10. You are responsible directly to your course coordinator. Any problems should be taken up directly with that person. In addition, you may speak with the Center Director about any aspects of your duties.

REMEMBER THAT YOU HAVE ONE OF THE MOST IMPORTANT JOBS IN OUR CENTER, THE CENTER DEPENDS ON YOU.

PROCEDURES TO BE FOLLOWED AFTER OBSERVING CHEATING (IMPEACHING)

If you observe someone cheating, immediately tell the student(s) what you observed. If the infraction is visual, you may seek confirmation by another TA; however, such confirmation is sometimes not possible and is not necessary. You might take the student's answer sheet and ask him or her to leave the room. Tell the student to see you immediately after the quiz. You may allow the student to continue the quiz after your warning, depending on your assessment of the magnitude of the infraction. If the student refuses to give you the answer sheet when asked to do so, or refuses to leave the laboratory, call Campus Security.

Remember- TAs are not Instructors of Record. Only the Lecture Instructor can take official action against the student. IF you tell a student that you are going to give him or her a "zero" for the quiz, you have exceeded your authority. Immediately after talking to the student (you may tell him or her what your recommendation will be), counsel with the student's Lecture Instructor. If action is to be taken, the instructor must do so in writing to the student's dean. Copies should be sent to the Center Director, the student, and the Dean of Students. The letter should detail the infraction and state what action the instructor has taken. If the student finished the quiz but failed, the instructor might choose to write a letter detailing the infraction but let the grade stand. If action is taken against the student, the student must have access to appeal.

If the student becomes vocally or physically abusive the behavior should be noted in the instructor's letter.

If you have evidence that one or more students have plagiarized work, accumulated the evidence and ask the laboratory coordinator to review the material. Show the material to the students' instructor(s). After a decision has been reached by the TA and the instructor, notify the student(s) immediately and tell them to contact the instructor(s). The instructor should file a letter with the student's dean, as above.

MAINTAINING YOUR TEACHING APPOINTMENT

TA appointments are made for an academic year starting with the fall term. However, your performance as a TA and as a graduate student will be reviewed each semester and a poor performance could lead to the loss of the TA appointment or failure to receive a TA re-appointment for the next semester. Students who do not have English as a first language need to pass the ESL test, and all students who serve as TA's need to take the TTU TA workshop.

Teaching performance will be evaluated from information provided by the faculty member serving as laboratory coordinator for the course in which you are teaching and from student evaluations. You must also remain in "good academic standing" by maintaining a GPA of 3.0 or higher each semester. Failure to meet this GPA requirement

will result in being placed on academic probation by the Graduate School and could cause you to lose a TA appointment. The evaluation for TA re-appointments will include an assessment of your progress toward completion of your degree.

You are also reminded that you must conduct your class and interact with students or other TAs in a professional manner. Texas Tech University takes offenses, such as sexual harassment very seriously and you must be cognizant of how your actions or words might be interpreted by others.

If there is a course in which you would like to teach, contact the faculty member coordinating the labs. The course coordinator will request specific TAs for his/her course.

RESIGNING A TEACHING ASSISTANTSHIP

As soon as the student holding a teaching assistantship knows that he/she will resign, he/she should notify the Graduate Coordinator or the Departmental Chairperson in writing. This will allow the Department's interest to be best served by seeking a replacement as quickly as possible.

If the student wishes to resign a TA to accept a research assistantship several factors will be considered.

1) Before 1 June the student can resign the TA without concern 2) After 1 June he/she will not be released from the TA contract unless a suitable student can be found to accept the teaching responsibilities.

3) The same applies to a student wishing to resign a TA in the fall to accept a RA in the Spring. He/she will be allowed to resign the TA without concern prior to 15 October.

TUTORING WHILE HOLDING A TEACHING ASSISTANTSHIP

Although you are encouraged to assist your students in every possible way to help them learn the course material, you are NOT allowed to tutor students for monetary gain.

RESOURCES

- Center for Biotechnology and Genomics
 - Experimental Sciences: Room 101
 - (806) 742-6927
 - <http://www.depts.ttu.edu/biotechnologyandgenomics/>
- TTU Graduate School
 - Administration Building: Room 328
 - (806) 742-2787
 - <http://www.depts.ttu.edu/gradschool/>
- TTU Graduate School Writing Center
 - Administration Building Room 43 (Inside Graduate Center)
 - <http://www.depts.ttu.edu/gradschool/gswc.php>
- Student Business Services
 - West Hall: Room 301
 - (806)742-3272
 - <http://www.depts.ttu.edu/studentbusinessservices/>
- Office of International Affairs
 - 601 Indiana Avenue
 - (806) 742-3667
 - <http://www.iaff.ttu.edu/main/index.asp>
- University Career Center
 - Wiggins Complex
 - (806) 742-2210
 - <http://www.depts.ttu.edu/careercenter/>
- MyTech (Online Class Registration) through Raiderlink
 - <http://www.ttu.edu>
- Graduate Catalog
 - <http://www.depts.ttu.edu/officialpublications/catalog/index.php>
- Environmental Health and Safety
 - <https://www.depts.ttu.edu/ehs/>
- TTU Library
 - <https://www.depts.ttu.edu/library/>

Advising Worksheet

Name: _____ R# _____

Degree: Master's in biotechnology (30 hours) _

FIRST YEAR

<u>FALL</u>	<u>SPRING</u>
Core Requirements- 15 hrs. BTEC 5338: Methods in Biotechnology -3 hrs. BTEC 6301: Intro to Biotechnology – 3 hrs. *BTEC 5322: Bioinformatics Method – 3 hrs. BTEC 5100: Scientific Communication – 1 hr. BTEC 6101: Biotechnology Seminar – 1 hr. CHEM 5104: Responsible Conduct Res. - 1hr. Elective 1 – 3 hrs. Elective 2 –3 hrs. (in place of BTEC 5322)	Capstone and Electives – 15 hrs. BTEC 5335: Capstone in Biotech – 3 hrs. Elective – 12 hrs.

***All coursework must be approved by the Graduate Advisor.**

***BTEC 5335: Capstone in Biotechnology – Must Register in Graduating Semester**

***Take BTEC 5322 in the spring and 9 hours of elective if you prefer to take an extra elective in the fall in place of BTEC 5322.**

Must enroll 18 hours in BTEC courses

Advising Worksheet

Name: _____ R# _____

Degree: Master's in biotechnology (38 hours) _ Concentration: _____

FIRST YEAR (20 credit hours Course-works)

<u>FALL</u>	<u>SPRING</u>
<p>Core Requirements- 11 hrs.</p> <p>BTEC 5338: Methods in Biotechnology -3 hrs. BTEC 6301: Intro to Biotechnology – 3 hrs. BTEC 5322: Bioinformatics Method – 3 hrs. BTEC 5100: Scientific Communication – 1 hr. CHEM 5104: Responsible Conduct Res.- 1hr.</p>	<p>Electives - 9 hrs.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

SECOND YEAR (18 hrs. Research)

<u>FALL</u>	<u>SPRING</u>
<p>BTEC 7000: Research in Biotech – 9 hrs.</p>	<p>BTEC 7000: Research in Biotech – 3 hrs. BTEC 6001: Biotech Internship – 6hrs. OR BTEC 6000: Master's Thesis – 6 hrs.</p>

***All coursework must be approved by the Graduate Advisor.**

*At least 20 hours of course work from the first year are required to be eligible for research concentrations.