Degree Program Assessment Plan

Degree Program - GRAD - Biotechnology (MS)

Disciplinary Accrediting Body: SACSCOC
CIP Code: 26.1201.00
Next Program Review: 20-21
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Program Purpose Statement: The major focus of the Biotechnology M.S. program offered by the Center for Biotechnology and Genomics is to integrate knowledge gained from formal and hands-on coursework during the first year of the program with applied technical skills and sound scientific inquiry during the experiential internship or thesis project during the second year of the program. Research opportunities and coursework are offered in a variety of areas, such as recombinant DNA technology, genomics, proteomics and bioinformatics, and are interdepartmental in scope, providing flexibility and cutting edge learning opportunities. The program capitalizes on highly productive teaching and research partnerships in both the basic and applied sciences and strong cooperative ties have been forged with academic institutions, federal laboratories, and public and private companies in Texas and throughout the region.

Student Learning Outcome: Knowledge

Students will acquire knowledge and concepts in the areas of biotechnology and understand its application to the society. They will be able to:
1. Describe what biotechnology is all about.
2. Recognize and appreciate the contribution of biotechnology to the society.
3. Outline the scientific disciplines that contributed to the biotechnology revolution.
4. Write scientific report, record and present data, and cite relevant literature.
5. List the phenomenal discoveries in biotechnology

Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2016

Assessment Methods

Post-Test - Students will take diagnostic test at the beginning and end of the first semester. Students will be evaluated based on their performance on the diagnostic test.

Criterion: Must score 80% or more in the second diagnostic test. Students scoring under 80% on the diagnostic will receive assistance to strengthen their knowledge base, and will take another diagnostic test at the end of the second semester. They must score higher than 80% to be eligible for the second year research experience (internship or thesis) of the program.

Schedule: Before they begin the program (before first semester), After the first semester and if necessary after the second semester.
Master's Comprehensive Exam - Students will demonstrate overall general and specific knowledge in the subject matter. Students will be assessed according to a rubric which has been developed by the committee. (Active)

**Criterion:** An overall score of 80% or more must be obtained. If not, the examination will be re-scheduled after giving the student time to review and prepare better for the comprehensive examination.

**Schedule:** Middle of April

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### Student Learning Outcome: Application

Students will be able to demonstrate their technical and transferable skills by conducting sound research and applying those skill sets in their research project. They will be able to:

1. Examine the scientific hypothesis.
2. Demonstrate the knowledge and skill to design and execute the research project.
3. Apply both theoretical and practical knowledge and technical skills to carry out the experiments.
4. Compute data and derive information.

**Outcome Status:** Active  
**Outcome Type:** Student Learning  
**Start Date:** 09/01/2015

### Assessment Methods

#### Student Projects - Research appraisal seminar at the end of third semester where students present progress of work done in their internship or thesis projects. Students will be assessed according to a rubric which has been developed by committee for assessing successful progress and application of knowledge and skills in their research projects. (Active)

**Criterion:** The evaluation instrument will provide information on areas of strengths and weaknesses, and allow targeted feedback to students and research mentors. Must score 80% or more

**Schedule:** Second week of December

**Oral exam** - Students will be graded according to a rubric which has been developed by the committee to assess ability to communicate the scientific results of their research projects both orally and in a written format (internship report or thesis). (Active)

**Criterion:** Must score 80% or above to pass the exam. If the results of this assessment are below 80%, the committee will provide feedback and helpful critiques so that the presentation and/or report may be edited and re-submitted.

**Schedule:** Second week of April

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### Student Learning Outcome: Synthesis

Students will be able to demonstrate ability to integrate and present scientific concepts with experimental science and communicate this professionally. Explicit learning outcomes are:

1. Integrate knowledge and skills to solve complex scientific problems.
2. Purpose the scientific hypothesis.
3. Design scientific experiments to generate meaningful data.
4. Compile data, generate a report and present it successfully.
5. Summarize the results and present it to general audience.
6. Integrate transferable and technical skills for successful job placement.
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Outcome Status: Active
Outcome Type: Student Learning
Start Date: 09/01/2015

**Assessment Methods**

<table>
<thead>
<tr>
<th>Performance</th>
<th>Students will give their final oral presentation to a committee and general audience. Students will also write an internship report or thesis. A rubric will be developed to assess the student’s demonstration of successful integration of knowledge and skills into devise of scientific hypothesis and communication of experimental results. (Active)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion</td>
<td>If the results of this assessment are below 80%, the committee will provide feedback and helpful critiques. Students must repeat the oral presentation and if necessary rewrite the report.</td>
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<tr>
<td>Schedule</td>
<td>Middle of April</td>
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<table>
<thead>
<tr>
<th>Employment</th>
<th>Efforts will be made to track successful employment after graduation, with at least 90% employed in biotechnology/science positions or pursuing continuing educational goals. (Active)</th>
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</thead>
<tbody>
<tr>
<td>Criterion</td>
<td>If less than 90%: Re-evaluation and updating of curriculum to provide the most current curriculum; continue to expand partnerships for the best research project and employment opportunities.</td>
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<tr>
<td>Schedule</td>
<td>Continuous effort after data analysis</td>
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