### Lamar University

#### Detailed Assessment Report

**2012-13 NC BIOL 1308 - Intro Biology (Non - Majors)**

| Purpose of understanding replication, transcription, and translation of a gene, the central dogma of biology. Students will be able to consider different points of view and to work effectively with others to support the shared purpose or goals. |

#### Student Learning Outcomes/Objectives, with Any Associations and Related Measures, Targets, Findings, and Action Plans

**SLO 1: Critical Thinking Skills through Enzymology**

Through manipulation, analysis, and evaluation of numerical data collected from cell physiology experiments involving enzymes, students will formulate conclusions on factors affecting enzyme function.

**Relevant Associations:**

**Standard Associations**

- New Core Component Areas
  - 1. Lifes & Physical Science (L & PS)
  - 2. New Core Objectives
  - 1. Critical Thinking (CT)

- **General Education/Core Curriculum Associations**
  - 1. Critical Thinking: Students will apply critical thinking appropriately to identify, analyze and resolve complex issues.
  - 2. Quantitative Thinking: Students will demonstrate mastery of quantitative reasoning and algorithms used to address applied problems.
  - 3. Communication: Students will develop written and oral presentations that are clear, precise, organized, efficient and appropriately adapted to audience and purpose.
  - 4. Teamwork: Includes the ability to collaborate effectively, consider different points of view, and work with others to support a shared purpose or goals.

**Related Measures**

- **M 1: Assessing Critical Thinking Skills through Enzymology**

Students will work in teams to perform experiments on invertebrate, and enzyme that catalyzes hydrolysis of sucrose, to determine the effects of temperature, concentration of enzyme, and concentration of substrate on activity. Data will be collected and analyzed graphically to evaluate rates and differences between treatments. Students will make written conclusions of results based on established hypotheses. Raw data, graphs, and conclusions will be completed in a worked format and a rubric will be applied to assess critical thinking skills.

**Definition**

Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (call one) level performance.

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Capstone</th>
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<table>
<thead>
<tr>
<th>Explanation of issues</th>
<th>Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.</th>
<th>Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.</th>
<th>Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.</th>
</tr>
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<thead>
<tr>
<th>Evidence</th>
<th>Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.</th>
<th>Information is taken from source(s) with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.</th>
<th>Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.</th>
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<tr>
<th>Influence of context and assumptions</th>
<th>Thoroughly (systematically and methodically) analyzes own and others’ assumptions and carefully evaluates the relevance of contexts when presenting a position.</th>
<th>Identifies own and others’ assumptions and several relevant contexts when presenting a position.</th>
<th>Questions some assumptions. Identifies several relevant contexts when presenting a position.</th>
</tr>
</thead>
</table>

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<tr>
<th>Student's position (perspective, thesis/hypothesis)</th>
<th>Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others’ points of view are synthesized within position (perspective, thesis/hypothesis).</th>
<th>Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others’ points of view are acknowledged within position (perspective, thesis/hypothesis).</th>
<th>Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.</th>
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</table>

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<tr>
<th>Conclusions and related outcomes (implications and consequences)</th>
<th>Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.</th>
<th>Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.</th>
<th>Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.</th>
</tr>
</thead>
</table>

from the American Association of Universities and Colleges, LEAP Value Rubrics

Source of Evidence: Project, either individual or group

**Target:**

60% of class scored a minimum of 2 out of 4 on the critical thinking rubric.

**Finding (2012-13) - Target: Not Reported This Cycle**

**Related Action Plans (by Established cycle, then alpha):**

For full information, see the Details of Action Plans section of this report.

**First-time offer BIOL 1308**

Established in Cycle: 2012-13

Run the BIOL 1308 course in 2014-2015 after preparing for all new labs in spring 2014.

#### SLO 2: Teamwork in Learning the Central Dogma of Biology

Students will be able to consider different points of view and to work effectively with others to support the shared purpose of understanding replication, transcription, and translation of a gene, the central dogma of biology.
SLO 3: Apply genetic principles in the manipulation and analysis of numerical data and observable facts to make informed related measures.

Relevant Associations:
- General Education/Core Curriculum Associations
  - Quantitative Thinking: Students will demonstrate mastery of quantitative reasoning and algorithms used to address applied problems.
  - Teamwork: Includes the ability to collaborate effectively, consider different points of view, and work with others to support a shared purpose or goals.

Related Measures:
- M2: Assessing Teamwork in Learning the Central Dogma of Biology

Using hands-on models, students will work in groups of four to assemble nucleotides, replicate daughter strands of DNA, transcribe mRNA, and translate polypeptide; students will then solve a series of gene replication or expression problems. A rubric will be used to assess teamwork in accomplishing the goal of learning the Central Dogma of Biology.

Definition:
Teamwork is behaviors under the control of individual team members (effort they put into team tasks, their manner of interacting with others on team, and the quantity and quality of contributions they make to team discussions.)

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

<table>
<thead>
<tr>
<th>Capstone</th>
<th>Milestones</th>
<th>Benchmark</th>
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<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
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</table>

**Contributes to Team Meetings**
- Helps the team move forward by articulating the merits of alternative ideas or proposals.
- Offers alternative solutions or courses of action that build on the ideas of others.
- Offers new suggestions to advance the work of the group.
- Shares ideas but does not advance the work of the group.

**Facilitates the Contributions of Team Members**
- Engages team members in ways that facilitate their contributions to meetings by both constructively building upon or synthesizing the contributions of others as well as noticing when someone is not participating and inviting them to engage.
- Engages team members in ways that facilitate their contributions to meetings by constructively building upon or synthesizing the contributions of others.
- Engages team members in ways that facilitate their contributions to meetings by restating the views of other team members and/or asking questions for clarification.
- Engages team members by taking turns and listening to others without interrupting.

**Individual Contributions Outside of Team Meetings**
- Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project.
- Proactively helps other team members complete their assigned tasks to a similar level of excellence.
- Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project.
- Completes all assigned tasks by deadline; work accomplished advances the project.
- Completes all assigned tasks by deadline.

**Fosters Constructive Team Climate**
- Supports a constructive team climate by doing any one of the following:
  - Provides assistance and/or encouragement to team members.
  - Treats team members respectfully by being polite and constructive in communication.
  - Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work.
- Supports a constructive team climate by doing any two of the following:
  - Provides assistance and/or encouragement to team members.
  - Treats team members respectfully by being polite and constructive in communication.
  - Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work.
- Supports a constructive team climate by doing any three of the following:
  - Provides assistance and/or encouragement to team members.
  - Treats team members respectfully by being polite and constructive in communication.
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- Supports a constructive team climate by doing any four of the following:
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- Supports a constructive team climate by doing any six of the following:
  - Provides assistance and/or encouragement to team members.
  - Treats team members respectfully by being polite and constructive in communication.
  - Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work.

**Responds to Conflict**
- Addresses destructive conflict directly and constructively, helping to manage/resolve it in a way that strengthens overall team cohesiveness and future effectiveness.
- Identifies and acknowledges conflict and stays engaged with it.
- Redirecting focus toward common ground, toward task at hand (away from conflict).
- Passively accepts alternate viewpoints/ideas/opinions.

(from the American Association of Universities and Colleges, LEAP Value Rubrics)

Source of Evidence: Project, either individual or group

Target:
- 60% of class scored a minimum of 2 out of 4 on the teamwork rubric.

Finding (2012-13) - Target: Not Reported This Cycle

No data; course not offered in 2012-2013.

Related Action Plans (as Established cycle, then alpha):

For full information, see the Details of Action Plans section of this report.

First-time offer: BIOL 1308
Established in Cycle: 2012-13
Run the BIOL 1308 course in 2014-2015 after preparing for all new labs in spring 2014.

SLO 3: Empirical and Quantitative Skills through Genetics Problems

Apply genetic principles in the manipulation and analysis of numerical data and observable facts to make informed conclusions on the outcome of genetic crosses and interpretation of pedigrees.

Relevant Associations:
- General Education/Core Curriculum Associations
  - Quantitative Thinking: Students will demonstrate mastery of quantitative reasoning and algorithms used to address applied problems.

Related Measures
M 3: Assessing Empirical and Quantitative Skills through Genetics Problems

Students will work independently on genetics problems (taken from question banks), and then present to the class their logic of approach and solution derived for assigned problems. A rubric will assess empirical and quantitative skills based on written and oral presentation of their work.

**Definition**

Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a “habit of mind,” competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (call one) level performance.

<table>
<thead>
<tr>
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<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interpretation</strong></td>
<td>Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)</td>
<td>Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.</td>
<td>Provides accurate explanations of information presented in mathematical forms. For instance, accurately explains the trend data shown in a graph.</td>
<td>Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units.</td>
<td>Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. For example, attempts to explain the trend data shown in a graph, but will frequently misunderstand the nature of that trend, perhaps by confusing positive and negative trends.</td>
</tr>
<tr>
<td><strong>Representation</strong></td>
<td>Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)</td>
<td>Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.</td>
<td>Competently converts relevant information into an appropriate and desired mathematical portrayal.</td>
<td>Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.</td>
<td>Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.</td>
</tr>
<tr>
<td><strong>Calculation</strong></td>
<td>Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)</td>
<td>Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.</td>
<td>Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.</td>
<td>Calculations are attempted but are both unsuccessful and are not comprehensive.</td>
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<tr>
<td><strong>Application / Analysis</strong></td>
<td>Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis</td>
<td>Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.</td>
<td>Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.</td>
<td>Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.</td>
<td>Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.</td>
</tr>
<tr>
<td><strong>Assumptions</strong></td>
<td>Ability to make and evaluate important assumptions in estimation, modeling, and data analysis</td>
<td>Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.</td>
<td>Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.</td>
<td>Explicitly describes assumptions.</td>
<td>Attempts to describe assumptions.</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)</td>
<td>Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.</td>
<td>Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the exposition may be uneven.</td>
<td>Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.</td>
<td>Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as &quot;many,&quot; &quot;few,&quot; &quot;increasing,&quot; &quot;small,&quot; and the like in place of actual quantities.)</td>
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</tbody>
</table>

from the American Association of Universities and Colleges, LEAP Value Rubrics

Source of Evidence: Presentation, either individual or group

Target: 60% of class scored a minimum of 2 out of 4 on the empirical and quantitative skills rubric.

Findings (2012-13) - Target: Not Reported This Cycle

No data, course not offered in 2012-2013.

Related Action Plans (by Established cycle, then alpha):

For full information, see the Details of Action Plans section of this report.

First-time offer BIOL 1308

Established in Cycle 2012-13

Run the BIOL 1308 course in 2014-2015 after preparing for all new labs in spring 2014.

SLO 4: Effective Communication of Environmental Problems

Students will be effective in development, interpretation and expression of an environmental problem through written, oral, and visual communication via a poster presentation.

Relevant Associations:

<table>
<thead>
<tr>
<th>Standard Associations</th>
<th>General Education/Core Curriculum Associations</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Core Component Areas</td>
<td>Critical Thinking: Students will apply critical thinking appropriately to identify, analyze and resolve complex issues.</td>
</tr>
<tr>
<td>1 Life &amp; Physical Science (L &amp; PS)</td>
<td>3 Communication: Students will develop written and oral presentations that are clear, precise, organized, efficient and appropriately adapted to audience and purpose.</td>
</tr>
<tr>
<td>New Core Objectives</td>
<td>4 Teamwork: Includes the ability to collaborate effectively, consider different points of view, and work with others to support a shared purpose or goals.</td>
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</tbody>
</table>

**Related Measures**

M 4: Assessment of Effective Communication of an Environmental Problem

Students will work in teams to identify an environmental problem, investigate the scientific basis of the issue, explore any opposing views and possible solutions, and then present their findings in a poster presentation to include both written and visual aids. The posters will be presented to the class in a “conference format” such that each student has an opportunity to be assessed on oral presentation of poster content.

**Definition**

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across
Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners’ attitudes, values, beliefs, or behaviors. Students are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (call one) level performance.

<table>
<thead>
<tr>
<th>Capstone</th>
<th>4</th>
<th>Milestones</th>
<th>3</th>
<th>Benchmark</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Context of and Purpose for Writing</strong>&lt;br&gt;Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</td>
<td>Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.</td>
<td>Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).</td>
<td>Demonstrates awareness of context, audience, purpose, and to the assigned task(s) (e.g., begins to show awareness of audience’s perceptions and assumptions).</td>
<td>Demonstrates minimal attention to context, audience, purpose, and to the assigned task(s) (e.g., expectation of instructor or self as audience).</td>
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<tr>
<td><strong>Content Development</strong>&lt;br&gt;Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer’s understanding, and shaping the whole work.</td>
<td>Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.</td>
<td>Uses appropriate and relevant content to develop and explore ideas through most of the work.</td>
<td>Uses appropriate and relevant content to develop simple ideas in some parts of the work.</td>
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<tr>
<td><strong>Genre and Disciplinary Conventions</strong>&lt;br&gt;Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).</td>
<td>Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task(s) including organization, content, presentation, formatting, and stylistic choices.</td>
<td>Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s) including organization, content, presentation, and stylistic choices.</td>
<td>Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation.</td>
<td>Attempts to use a consistent system for basic organization and presentation.</td>
<td></td>
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</tr>
<tr>
<td><strong>Sources and Evidence</strong>&lt;br&gt;Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing.</td>
<td>Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.</td>
<td>Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.</td>
<td>Demonstrates an attempt to use sources to support ideas in the writing.</td>
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<td></td>
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</tr>
<tr>
<td><strong>Control of Syntax and Mechanics</strong>&lt;br&gt;Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.</td>
<td>Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.</td>
<td>Uses language that generally conveys meaning to readers, although writing may include some errors.</td>
<td>Uses language that sometimes impedes meaning because of errors in usage.</td>
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</table>

**Organization**<br>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.

**Language**<br>Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.

**Delivery**<br>Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.

**Supporting Material**<br>A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter’s credibility/authority on the topic.

**Central Message**<br>Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)

**Milestones**

<table>
<thead>
<tr>
<th>Source of Evidence:</th>
<th>Understanding, or to promote change in the listeners’ attitudes, values, beliefs, or behaviors.</th>
<th>Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners’ attitudes, values, beliefs, or behaviors. Students are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (call one) level performance.</th>
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| **SL0 5: Scientific Method**<br>Identify and recognize the principal tenants of the Scientific Method and apply that knowledge to its use in the practice of science. Distinguish the Scientific Method from other forms of inquiry. | Relevant Associations: | Standard Associations:
| New Core Component Areas | 1. Critical Thinking: Students will apply critical thinking appropriately to identify, analyze and resolve complex issues. | 2. Life & Physical Sciences (L & PS)
| New Core Objectives | 2. Quantitative Thinking: Students will demonstrate mastery of quantitative reasoning and algorithms used to address applied problems. | |
| General Education/Core Curriculum Associations | Strategic Plan Associations: | Lamar University
13.1 Strategic plan reviewed but no clear match to the outcome exists. |
Related Measures

M 5: Testing on the Scientific Method
The following five questions will be embedded into the first lecture exam.

1. When a hypothesis has been repeatedly and rigorously tested and supported it is called a _______.
   a. model.
   b. testable prediction.
   c. scientific method.
   d. scientific theory.

2. In order to arrive at a solution to a problem, a scientist usually proposes and tests
   a. laws.
   b. theories.
   c. hypotheses.
   d. principles.

3. Three of the four answers listed below are aspects of the scientific method. Select the exception.
   a. observation
   b. hypothesis
   c. experimentation
   d. philosophy

4. In a control group, the ______ being manipulated in the experiment is held constant.
   a. Variable
   b. Observation
   c. Question
   d. Theory

5. An experimenter does all but which of the following?
   a. revises a hypothesis as a result of data collected
   b. manipulates dependent variables
   c. reviews other research results obtained by other scientists
   d. examines the effects of independent variables

Source of Evidence: Standardized test of subject matter knowledge

Target:
Students will answer questions correctly at a rate of 65% or better (average over all 5 questions).

Finding (2012-13) - Target: Not Reported This Cycle
No data; course not offered in 2012-2013.

Related Action Plans (by Established cycle, then alpha):
For full information, see the Details of Action Plans section of this report.

First-time offer BIOL 1308
Established in Cycle 2012-13
Run the BIOL 1308 course in 2014-2015 after preparing for all new labs in spring 2014.

SLO 6: Cell Biology Knowledge
Identify and recognize the principal tenants of the Cell Theory. Distinguish between prokaryotic, eukaryotic, plant and animal cells, and identify major cell structures. Identify stages of the cell cycle, mitosis (plant and animal), and meiosis.

Relevant Associations:

Standard Associations
New Core Component Areas
2 Life & Physical Science (L & PS)
New Core Objectives
1 Critical Thinking (CT)

General Education/Core Curriculum Associations
1 Critical Thinking: Students will apply critical thinking appropriately to identify, analyze and resolve complex issues.

Strategic Plan Associations
Lamar University
13.1 Strategic plan reviewed but no clear match to the outcome exists

Related Measures

M 6: Testing on Cell Biology Concepts
The following five questions will be embedded in the second exam.

1. Which group possesses a nucleus?
   a. Eukaryotes
   b. Bacteria
   c. Archaea
   d. Prokaryotes
   e. All of these choices.

2. Which cell structure represents the boundary surrounding the cytoplasm, DNA, and all other internal cell components of either prokaryote or eukaryote cell types?
   a. Cell wall
   b. Plasma membrane
   c. Lysosome
   d. Mitochondria
   e. Nucleus

3. Which cell structure is seen in plants but not animals?
   a. ribosomes
   b. chloroplasts
c. mitochondria

d. cytoskeleton

e. nucleus

4. Chromosomes are duplicated during which stage of the cell cycle?
   a. M
   b. S
   c. G1
   d. G2
   e. None of the above

5. There will be a diagram showing the four stages of meiosis I in random order to be used for one of the following four question options:
   3a. Which is a germ cell in metaphase I?
   3b. Which is a germ cell in prophase I?
   3c. Which is a germ cell in telophase I and in the process of cytokinesis?
   3d. In which stage do cross-overs of maternal and paternal homologous chromatids happen?

Source of Evidence: Standardized test of subject matter knowledge

Target: Students will answer questions correctly at a rate of 65% or better (average over all 5 questions).

Finding (2012-13) - Target: Not Reported This Cycle

No data, course not offered in 2012-2013.

Related Action Plans (by Established cycle, then alpha):

First-time offer BIOL 1308

Established in Cycle: 2012-13

Run the BIOL 1308 course in 2014-2015 after preparing for all new labs in spring 2014.

Details of Action Plans for This Cycle (by Established cycle, then alpha)

First-time offer BIOL 1308

Established in Cycle: 2012-13

Implementation Status: Planned

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Assessing Critical Thinking Skills through Enzymology | Outcome/Objective: Critical Thinking Skills through Enzymology
Measure: Assessing Empirical and Quantitative Skills through Genetics Problems | Outcome/Objective: Empirical and Quantitative Skills through Genetics Problems
Measure: Assessing Teamwork in Learning the Central Dogma of Biology | Outcome/Objective: Teamwork in Learning the Central Dogma of Biology
Measure: Assessment of Effective Communication of Environmental Problems | Outcome/Objective: Effective Communication of Environmental Problems
Measure: Testing on Cell Biology Concepts | Outcome/Objective: Cell Biology Knowledge
Measure: Testing on the Scientific Method | Outcome/Objective: Scientific Method

Implementation Description: Design labs, purchase new equipment, and test all new lab activities in spring 2014 for implementation in fall 2014.

Responsible Person/Group: Dr. Matthew P Hoch

Additional Resources: Half-time release in spring 2013 is required ($23,000) in Fall 2014. New supplies and equipment are required, and estimated to cost about $10,000.

Budget Amount Requested: $33,000.00 (one time)