Instructional Unit – Program Review
2016-2018

Part 1: - Program Overview

Program Name: Biology

Program Mission and Description: The Biology Department offers a diverse array of courses that serve as core requirements for students pursuing associate and baccalaureate degrees in a number of academic disciplines. As a result, the department mission emphasizes the following: (1) faculty are to prepare all students(science & non-science majors) for their future career goals; and (2) students should be exposed to scientific knowledge that would allow them to make informed decisions as they relate to biological matters.

Program Admission and Awards:

The Biology Department supports the Associate in Arts, Associate in Science and the Associate in Applied Science curriculums through Area III. Both our biology for majors (Bio 103, 104) and biology for non-majors (Bio 101, 102) can help to fulfill the 8 hours of Natural Sciences with laboratory requirement in Area III. In addition, several career programs have specific Biology course requirements. The table below outlines these programs and the courses within the Biology department that are required.

Table 1. Biology Course Program Distribution

Biology Courses	Programs that Utilize Biology Courses					Degree Awarded
BIO 101*						Transfer AA/AS
BIO 102*						Transfer AA/AS
BIO 103*	Clinical Laboratory Technology	Emergency Medical Service (Paramedic	Biomedical Equipment Technology	Veterinary Technology		Transfer AA/AS
BIO 104*						Transfer AA/AS
BIO 111	Funeral sciences					AA/AS
BIO 201	Clinical Laboratory Technology	Biomedical Equipment Technology	Nursing	Physical Therapy Assistant	Radiological Technology	AA/AS
BIO 202	Nursing	Physical Therapy Assistant	Radiological Technology			AA/AS
BIO 220	Nursing					AA/AS

***Area III Courses**

Table 2. 2016-2019 Biology Program Demographics

Category*	Student Totals (3yrs)	Percentage (of total students)
Total Students*	11127	100%
Number of Male	3318	30%
Number of Female	7808	70%
Age 18-25	7474	67%
Age 26-40	2962	27%
Age 41+	663	6%
African American Students	2741	25%
Asian Students	237	2%
Caucasian Students	7053	63%
Hispanic Students	636	6%

Table 3. Disaggregated Biology Program Demographics

Category*	2016-2017	2017-2018	2018-2019	2016-2019
Total Students	100%	100%	100%	100%
Number of Male	30%	30%	29%	30%
Number of Female	70%	70%	71%	70%
Age 18-25	62%	68%	72%	67%
Age 26-40	31%	26%	23%	27%
Age 41+	7%	6%	5%	6%
African American Students	24%	26%	24%	25%
Asian Students	2%	2%	2%	2%
Caucasian Students	65%	62%	64%	63%
Hispanic Students	5%	6%	6%	6%

*Unduplicated headcounts

Enrollment in biology course averaged 3709 per academic year. The number of females was significantly higher than males with an average of 70% compared to 30% for all three years. The difference in gender is consistent with the overall colleges demographic. A three year trend was noted when comparing age cohorts. Students between the ages of 18-25 showed a 10 % increase in enrollment compared to an 8% decrease for students 26-40 years of age. Additionally, the results indicated that there were no significant changes in student enrollment based on ethnicity.

Modes of Delivery

The Biology utilizes three modes of delivery – traditional classroom instruction, internet, and hybrid. Over the three years we noticed a decline in total number of courses offered. Interestingly, the decline in total sections corresponds to a decrease in traditional courses being offered, even as there is an increase in the number of internet and hybrid courses being offered.

Table 4. Modes of Delivery

Modes of Delivery	Total Sections	Traditional	Internet	Hybrid
2016-2017	**212**	**156**	**16**	**40**
2017-2018	**210**	**151**	**19**	**40**
2018-2019	**207**	**142**	**21**	**44**

Program/Department Goals:

1. **Provide pre-professional programs that offer a structured, timely and comprehensive education.**

   The department continues to offer courses that provide a comprehensive introduction to the biological sciences.

2. **Provide quality instruction in freshman and sophomore level courses in biology that transfer to senior institutions, and that lead to associate degrees.**

   The department offers four transferable biology courses (BIO101, 102, 103, & 104) that meet requirements for both the associates and baccalaureate degrees. Historically we have always offered BIO 101, 102, and 103 during every semester and BIO 104 only during the summer and spring. We now offer BIO 104 every semester. We also have multiple campuses offering online sections of BIO 101 and BIO 102. The increase in the number of online courses offered over the three years of the study can be attributed to an increase in BIO 101/102 sections.

3. **Prepare students with a strong content knowledge in biology with emphasis on critical thinking and problem-solving skills, which will allow them to meet their career goals**.

   The biology department offers courses that serve the needs of the non-majors, majors, and allied health students. Each course has a distinctive set of specific objectives and a broader set of student learning objectives which enable both faculty and students to stay abreast of the core content that is pertinent to the overall subject matter. Additionally, each course in the department has a

laboratory component. This part of the course allows students to demonstrate problem solving and critical thinking skills as they conduct experiments, analyze data, and complete dissections.

4. **Advise students regarding choice of courses relevant to their academic major and senior institution. The Biology Department is committed to excellence in student advisement and career planning.**

   Faculty members advise students during the college's regularly scheduled advising and New Student Orientation sessions. Additionally, all faculty members maintain and "open-door" policy as it pertains to assisting students with their academic and career guidance needs.

5. **Support public service activities by providing faculty expertise to government agencies, to industry, to educational systems and professionals desiring additional scientific education or advice.**

   Throughout the three-year period, faculty members volunteered and participated in a number of professional development activities. Their activities and contributions to the department are as follows:

   Dr. Erin Arnold – In 2017 was part of the Alabama Scientific Advisory Group and organized a luncheon meeting at Jefferson State entitled "Science Education and Workforce Development" with Key Note speaker Congressman Gary Palmer. In 2017 Dr. Arnold also co-developed the Jeffstate Overseas, an experiential travel abroad program designed to increase opportunities for Community College students to experience overseas travel. The summer of 2018 attended the ACCS master teacher program. In 2018 entered into a collaboration with UAB as part of the ROSE (research on college education) network. In 2019 was awarded a ROSE fellowship to implement a course based undergraduate research initiative in microbiology sections. Currently is a member of the Instructional Leadership Academy.

   Martha Ross – In 2016 participated in a Harvard X online course entitled "Saving Schools." Received an A and a completion certificate. Was a 2017 recipient of the Chancellor Award from the ACCS. In 2018 lobbied in Montgomery for more effective rural healthcare and spoke tothe benefits of Community College as a member of Alabama Arise. Currently part of the working group to improve and standardize BIO 103 at the ACCS.

   Charles Venglarik – Maintains a faculty website with anatomical images for public use. Designed and maintains the SLO spreadsheets used throughout the biology department. Currently part of the working group to improve and standardize BIO 104 at the ACCS.

Dr. Kelley Black – Over the self-study period attended various microbiology and immunology seminars at UAB. In 2018 wrote and published Microbiology Laboratory Manual with publisher Kendall-Hunt.

Courtney Fernandez Petty – Participated in the ACCA webinar on student engagement. Attended the CFBG Strategic Plan Meeting and was elected Associate Director of Communications for the Association for Women in Science.

Nic Kin – Co-PI of the NIH funded Bridges to Baccalaureate program with UAB. From 2016 – present served as an NIH grant reviewer Participated in UAB program for postdoctoral students to explore career options, represented community college education. Attended the SACS-COC Conference, Health Disparities conference, and a Grant writing workshop. Currently is a ROSE network participant and ACCS faculty professional development participant.

Tom Baker – Mr. Baker was part of a group of instructors who offered open lab time for A&P students in order to improve student retention and better prepare students for lab course content and practical assessments. He made himself available to students for additional tutoring outside of class time.

Dr. Meena Bej – Dr. Bej was selected as a participant in the Alabama Community College Systems' 2019 Instructional Leadership Academy. As well she continues to stay abreast of current research in the biological sciences and medicine through literature searches and attending seminars at the University of Alabama at Birmingham.

Zareen Dodwad-Khan-Dr.-Dr. Khan attended the ACCS conference in the Fall 2018. She was a participant in ROSE collaboration with UAB to re-evaluate BIO 103 effectiveness and ways to incorporate CURE experiences into the labs at JSCC. She added quizzes to help students keep up with studying, created alternative homework and lab assignments (such as poster and 3D models) as a way to keep her Anatomy & Physiology students motivated. She has a desire to take on a leadership role and collaborate with colleagues to reassess their approach to A&P class to increase student retention and pass rates.

Dr. Julie Maharrey- Dr. Maharrey is responsible for providing the SLO compilation data for BIO 202 for the department. She continues to be a guide for her student in Human Anatomy and Physiology courses. She offers a variety of assignments, which include online resources such as EdPuzzles and Wiki to help students identify their best way to learn, develop critical thinking skills and foster independence.

Stephanie Miller – Ms. Miller was hired as the Shelby Campus Chairperson for the Biology department in Summer 2018. Ms. Miller was selected to become a member of the Instructional Administrators Association Fall 2018. She attended the Fall 2018 ACCS conference. She continues to serve as a member of Jefferson

State's Selection Committee for the college's Leadership Academy. She was a participant in ROSE collaboration with UAB to re-evaluate BIO 103 effectiveness and ways to incorporate CURE experiences into the labs at JSCC. Stephanie continues to work to provide quality instruction to her students to foster their learning and success in the classroom, their clinical programs and/or their transfer goals.

Amanda Swindall – Dr. Swindall is a member of the Honors day committee. She participated in the Yale University Summer Institutes on Science Teaching Online Seminars. She was a collaborator on a grant submitted to NIH by Dr. Nic Kin. She was a participant in ROSE collaboration with UAB to re-evaluate BIO 103 effectiveness and ways to incorporate CURE experiences into the labs at JSCC. Amanda developed and taught a BIO 101 online course Summer 2019 for the Clanton campus. She incorporated Augmented Reality Cadaver dissection into BIO 201/202 lab experiences via Virtual Body Lab simulations.

Program/Department Outcomes Achievement: The program goals that are explicitly linked to our student learning outcomes would be goals 2 and 3.

The Biology Department offers four courses which meet Area III requirements for transfer to Alabama public four-year institutions. These courses include the following: Introduction to Biology I and II and Principles of Biology I and II. Of these four courses, Introduction to Biology I is the most frequently offered course of the three-year period with an average of 35 course sections.

A review of 3-year assessment data identified certain trends and targets for improvement. When analyzing the data for our non-majors offerings – BIO 101 and BIO 102, the results showed a definite increase in learning success compared to our last 3 year program review (2013-2016), with one exception – SLO 3 of BIO 101 (identification of human anatomical structures and understanding of human physiology). Despite efforts to incorporate anatomical models and dissections into the BIO 101 laboratory offering, we are still falling short. That said, BIO 101 and BIO 102 also represent the only course offerings that can be taken 100% online. Approximately 30% of BIO 101 sections and 50% of BIO 102 sections are online sections, without an experiential lab. The challenge we face currently is how to ensure the internet course is equivalent to the traditional course, particularly in regard to a laboratory experience.

The results for the science major courses, Principles of Biology I (103) and II (104) varied across the three-year range. In BIO 103, student scores were lower than in the previous 3-year report. This could be due to more accurate assessment - initially we were surveying only select sections and now we have moved to assessing every section offered. We are taking a variety of approaches to increase outcomes in BIO 103. We are currently reviewing textbooks to determine which would provide content that is tailored to our majors biology courses and provide the material in a manner that is more accessible to our students. We are also collaborating with the ROSE (research on science education) initiative at UAB to study and implement approaches that improve learning outcomes in majors level biology. As part of this collaboration, we have workshopped with our colleagues at UAB and have also developed

working groups to address topics including the textbook and resources, content, and student retention.

The Principles of Biology II (104) assessment data revealed students were successful in mastering only SLO 2 which addresses animal and plant classification and characteristics. This is an improvement from the last three-year cycle when none of the SLOs were mastered by 70% of the students. The mastery of SLO 2 can be attributed to a concerted effort to improve upon the laboratory experience across all sections of BIO 104. In the last cycle we committed to standardization and sharing of resources between the two campuses and it appears that has had some success at least in the laboratory. In order to improve on student success in SLO 1 and SLO 3, renewed efforts to highlight evolution and ecology throughout the semester will be implemented.

The Biology department offers feeder courses for the Nursing and Allied Health programs. These courses include Anatomy and Physiology I and II and Microbiology. These courses are not part of the STARS articulation agreement. However, students pursuing BS degrees in Nursing and Allied Health fields as well as students meeting criteria for graduate degree programs may complete the courses.

The Anatomy and Physiology I (201) and Anatomy and Physiology II (202) data showed that across the two-semester anatomy and physiology offerings, students have consistently mastered the concept of homeostasis and can identify and recognize major structures for the systems studied. Results indicate students struggled and were unable to meet the criteria for success when presented with more conceptual material – defining the structural and functional relationship and understanding the physiology of the various organ systems. Approaches to these weaknesses include stressing the structure-function relationship whenever relevant and incorporating case studies, whereby students apply their knowledge of the organ systems to a realistic scenario. Success rates did increase across the board for BIO 202. Concerted efforts were made to address weaknesses in the understanding of physiology concepts by incorporating case studies throughout the semester. This led to an increase in success from 65% to 81% for BIO 202 SLO 1, which covers organ system physiology.

Results from student performance in Microbiology (220) overwhelmingly demonstrated success in all but the first SLO. The first SLO covers the most basic biology information, highlighting the lack of biology background of most of our students. The topics covered include cellular biology, cellular respiration, and genetics. It should be noted that general biology (BIO 103) is NOT a prerequisite for BIO 220. The biology faculty overwhelming supports a mandatory requirement of Principles of Biology I as a standard pre-requisite for the course. If students were to take BIO 103 before BIO 220, faculty believe there would be an increase not only in the content covered in SLO1 but better overall class achievement. In the meantime, the department will implement approaches that include faculty stressing basic cell biology throughout the semester through supplemental activities and emphasis in the laboratory.

Part 2: Program/Department Change

Program/Department Goal Changes: We have not currently changed our departmental goals.

Course Student Learning Outcome Changes: Within this cycle we moved to ensure that all sections across all four campuses are assessed. Each semester we get closer to achieving that goal.

Part 3: Evidence of Staff Participation in Program Review

Faculty/staff participation: The majority of departmental faculty participates in the SLO assessment and analysis process. Roles are divided by course offerings as can be seen in the below table. Faculty members that have not assigned a course will be included in the next cycle.

Table 4. Faculty SLO Course Assignments

BIO 101	BIO 102	BIO 103	BIO 104	BIO 201	BIO 202	BIO 220	Document compilation
Meena Bej	Charles Venglarik	Martha Ross	Charles Venglarik	Brenda Hammer	Erin Arnold	Stephanie Miller	Erin Arnold
Erin Arnold	Nakia Robinson	Amanda Swindall	Martha Ross	Julie Maharrey	Tom Baker	Kelley Black	
						Erin Arnold	

*All SLO data is collected and compiled into Excel spreadsheets (designed by Charles Venglarik) each semester.

The department meets annually to review the SLO assessment data and determine recommendations for improvement the next academic year.

Advisory committee minutes (if applicable) and list of members: No changes have been made at this time.

Assessment Record

Program: Biology (BIO 101) **Assessment period: Fall 2016 – Summer 2019**

Program or Department Mission:

Program or Department Mission:
The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Biology 101 Course Level Assessment Rubric:

General Education Objective

The student will demonstrate ability to apply reasoning and logic to assess ideas and situations, support positions, draw conclusions, and solve problems

The student will demonstrate understanding of mathematical concepts and scientific principles, and ability to use computers

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels.
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes

1. Students will recognize how the scientific method is utilized to explore biological processes.
2. Students will have the ability to recognize biological processes at the molecular, cellular and organismal levels.
3. Students will demonstrate an ability to identify basic anatomical structures and the correlating physiology of human systems.

<table>
<tr><th>Intended Outcomes</th><th>Means of Assessment</th><th>Criteria for Success</th><th>Summary & Analysis of Assessment Evidence</th><th>Use of Results</th></tr>
<tr>
<td>1. Students will recognize how the scientific method is utilized to explore biological processes</td>
<td>Student learning outcomes were assessed by using a 15 question standardized multiple choice examination at the end of the semester. A total of three questions (Q-1 – Q-3) were used to assess SLO-1.</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO 1.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 293
correct = 614
% correct = 70%</td></tr>
<tr><td>Shelby</td><td># students tested = 350
correct = 894
% correct = 85%</td></tr>
<tr><td>Pell City</td><td># students tested = 107
correct = 247
% correct = 77%</td></tr>
<tr><td>Clanton</td><td># students tested = 97
correct = 212
% correct = 73%</td></tr>
</table>
Total Students Tested = 847
Total Success Rate = 77%
</td>
<td>The students tested did meet the requirements for success for SLO 1.

The success rate for SLO 1 averaged 77%. This is a marked improvement from the last 3 year report, where success was measured at 62%. This could be in part to a concerted effort to assess each and every section. We also edited the SLO assessment survey to introduce clarity into some of the questions students had the most trouble with.

We have also worked over the past three years to stress the scientific method</td>
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<td>throughout the semester. The use of case studies has also been encouraged through out the department.</td>
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<tr>
<td>2. Students will have the ability to recognize biological processes at the molecular, cellular and organismal levels</td>
<td>Student learning outcomes were assessed by using a 15 question standardized multiple choice examination at the end of the semester. A total of seven questions (Q4-Q10) were used to assess SLO-2.</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO 2.</td>
<td>
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% correct = 62%</td></tr>
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correct = 1789
% correct = 73%</td></tr>
<tr><td>Pell City</td><td># students tested =107
correct = 578
% correct = 77%</td></tr>
<tr><td>Clanton</td><td># students tested =97
correct = 481
% correct = 71%</td></tr>
</table>
Total Students Tested = 847
Total Success Rate = 70%
</td>
<td>The students tested did meet the requirements for success for SLO 2.

The success rate for SLO 2 is 70%, which is higher than the last 3 year report which was 64%. This could be in part to a concerted effort to assess each and every section. We also edited the SLO assessment survey to introduce clarity into some of the questions students had the most trouble with.

Instructors have been encouraged to utilize case studies throughout the semester to demonstrate the relevance of the material to the students.</td>
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<tr>
<td>3. Students will demonstrate an ability to identify basic anatomical structures and the correlating physiology of human systems</td>
<td>Student learning outcomes were assessed by using a 15 question standardized multiple choice examination at the end of the semester. A total of five questions (Q11-Q15) were used to assess SLO-3.</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO 3.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 293
correct = 657
% correct = 45%</td></tr>
<tr><td>Shelby</td><td># students tested = 350
correct = 892
% correct = 51%</td></tr>
<tr><td>Pell City</td><td># students tested =107
correct = 348
% correct = 65%</td></tr>
<tr><td>Clanton</td><td># students tested =97
correct = 302
% correct = 62%</td></tr>
</table>
Total Students Tested = 847
Total Success Rate = 52%
</td>
<td>The students tested did not meet the requirements for success for SLO 3.

The success rate for SLO 3 was 52%, which was a slight decrease from the previous 3 year report. This SLO is historically our hardest to find success with. Over the past three years we have experimented with using the anatomy models from BIO 201 and BIO 202 and also doing a fetal pig dissection in some sections. This does not address the increase in students taking the course online.

To address the students taking the course online we are looking to add virtual dissections and dissection videos.</td>
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Assessment Record

Program: Biology (BIO 102) **Assessment period:** Fall 2016 – Summer 2019

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Biology 102 Course Level Assessment Rubric:

General Education Objective

The student will read, understand, and evaluate materials written at a variety of levels and for a variety of purposes.

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course level student learning outcomes

1. Students will demonstrate knowledge of evolution in both plant of animal life.
2. Students will identify general characteristics, anatomy, and taxonomy of plant and animals.

3. Students will explain the interrelationships between the varied life forms on earth and identify the role of humans within ecological systems.

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence	Use of Results
1. Students will demonstrate knowledge of evolution in both plant of animal life.	Student learning outcomes were assessed by using a 25 question standardized multiple choice examination at the end of the semester. A total of 7 questions (Q1-Q7) were used to assess SLO 1.	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO 1.	Jefferson: # students tested = 64 # correct = 356 % correct = 79% Shelby: # students tested = 208 # correct = 908 % correct = 62% Pell City: # students tested =22 # correct = 113 % correct = 73% **Total Students Tested = 294** **Total Success Rate = 67%**	The students tested did not meet the requirements for success for SLO 1. The success rate for SLO 1 was 67%. This is just below 70% and is exactly the same as what we found in our last 3 year review. We will work to include evolution across all topics in order to reinforce this central biological concept.
2. Students will identify general characteristics, anatomy, and taxonomy of plant and animals.	Student learning outcomes were assessed by using a 25 question standardized multiple choice examination at the end of the semester. A total of 14	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO 2.	Jefferson: # students tested = 64 # correct = 679 % correct = 76% Shelby: # students tested = 208 # correct = 1941 % correct = 67% Pell City: # students tested =22 # correct = 254 % correct = 82% **Total Students Tested = 294**	The students tested did meet the requirements for success for SLO 2. The success rate for SLO 2 was 70%. This is right at the goal and represents a 4% increase in success from the previous 3 years.

<table>
<tr>
<td></td>
<td>questions (Q8-Q21) were used to assess SLO 2.</td>
<td></td>
<td>Total Success Rate = 70%</td>
<td>Efforts were made to increase the number of dissections and models in the laboratory over the past 3 years. We will continue to enhance the BIO 102 lab experience and look at offering comparable experiences for the online labs.</td>
</tr>
<tr>
<td>3. Students will explain the interrelationships between the varied life forms on earth and identify the role of humans within ecological systems.</td>
<td>Student learning outcomes were assessed by using a 25 question standardized multiple choice examination at the end of the semester. A total of 4 questions (Q22-Q25) were used to assess SLO 3.</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO 3.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 64
correct = 201
% correct = 79%</td></tr>
<tr><td>Shelby</td><td># students tested = 208
correct = 525
% correct = 63%</td></tr>
<tr><td>Pell City</td><td># students tested =22
correct = 84
% correct = 95%</td></tr>
</table>
Total Students Tested = 294
Total Success Rate = 69%
</td>
<td>The students tested did not meet the requirements for success for SLO 3.

The success rate for SLO 3 was 69%. This is slightly below the 70% goal and represents a 3 point increase when compared to the last 3 year program review(65%).

Efforts have been made to increase the instructional time dedicated to ecology. We will continue to improve our coverage of ecology.</td>
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Assessment Record

Program: Biology (BIO 103) **Assessment period:** Fall 2018 – Summer 2019

Program or Department Mission:

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Biology 103 Course Level Assessment Rubric:

General Education Objective

The student will demonstrate ability to apply reasoning and logic to assess ideas and situations, support positions, draw conclusions, and solve problems

The student will demonstrate understanding of mathematical concepts and scientific principles, and ability to use computers

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness communit
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes

1. Students will demonstrate knowledge of the fundamental concepts and processes in biology including the scientific method, evolution,

biological macromolecules and biochemistry
2. Students will demonstrate an ability to identify molecular and cellular processes in prokaryotic and eukaryotic cells.
3. The student will demonstrate an ability to recognize genetic, morphological and life cycle characteristics of bacteria, fungi, and viruses.

<table>
<tr><th>Intended Outcomes</th><th>Means of Assessment</th><th>Criteria for Success</th><th colspan="2">Summary & Analysis of Assessment Evidence</th><th>Use of Results</th></tr>
<tr><td>1. Students will demonstrate knowledge of the fundamental concepts and processes in biology including the scientific method, evolution, biological macromolecules and biochemistry</td><td>Student learning outcomes were assessed by using a 12 question standardized multiple choice examination at the end of the semester. A total of four questions (Q1 – Q4) were used to assess SLO1</td><td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO1</td><td colspan="2"><table><tr><td>Jefferson</td><td># students tested = 227
correct = 794
% correct = 87%</td></tr><tr><td>Shelby</td><td># students tested = 251
# correct = 722
% correct = 72%</td></tr><tr><td>Pell City</td><td># students tested =31
# correct = 93
% correct = 75%</td></tr><tr><td>Clanton</td><td># students tested =72
# correct = 232
% correct = 81%</td></tr></table>Total Students Tested = 581
Total Success Rate = 79%</td><td>The students tested did meet the requirements for success for SLO 1.

The success rate for SLO 1 is 79% This is above the 70% standard we were trying to obtain and is an increase of 2% from the last program review.

We will continue to include chemistry review and incorporate principles from SLO 1 throughout our courses.</td></tr>
</table>

<table>
<tr>
<td>2: Students will demonstrate an ability to identify molecular and cellular processes in prokaryotic and eukaryotic cells.</td>
<td>Student learning outcomes were assessed by using a 12 question standardized multiple choice examination at the end of the semester. A total of seven questions (Q5 – Q11) were used to assess SLO2</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO2</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 227
correct = 1073
% correct = 68%</td></tr>
<tr><td>Shelby</td><td># students tested = 251
correct = 965
% correct = 55%</td></tr>
<tr><td>Pell City</td><td># students tested =31
correct = 98
% correct = 45%</td></tr>
<tr><td>Clanton</td><td># students tested =72
correct = 275
% correct = 55%</td></tr>
</table>
Total Students Tested = 581
Total Success Rate = 59%
</td>
<td>The students tested did not meet the requirements for success for SLO 2.

The success rate for SLO 2 was 59%, which is a significant decrease from the last 3 year report where SLO 2 had a success rate of 68%.

We are currently reviewing the textbook that is used in this course and are considering other textbooks that may make the information easier to access and understand. Additionally, we will incorporate labs that address current topics in Biology to encourage active participation in the science process which may lead to a</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td>better understanding of complex processes addressed in this SLO.</td></tr>
<tr><td>3: The student will demonstrate an ability to recognize genetic, morphological and life cycle characteristics of bacteria, fungi, and viruses.</td><td>Student learning outcomes were assessed by using a 12 question standardized multiple choice examination at the end of the semester. A total of three questions (Q12 – Q14) was used to assess SLO3</td><td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered question related to SLO3</td><td><table><tr><td>Jefferson</td><td># students tested = 227
correct = 536
% correct = 79%</td></tr><tr><td>Shelby</td><td># students tested = 251
# correct = 356
% correct = 47%</td></tr><tr><td>Pell City</td><td># students tested =31
# correct = 54
% correct = 58%</td></tr><tr><td>Clanton</td><td># students tested =72
# correct = 151
% correct = 70%</td></tr></table>
Total Students Tested = 581
Total Success Rate = 63%</td><td>The students tested did not meet the requirements for success for SLO 3.

The success rate for SLO 3 was 63%. Again, this represents a decrease from the last 3 year review. That said, we did update the SLO assessment to add 2 more questions so that SLO 3 was assessed by more than one question.

We will attempt to cover this material comparatively throughout the course instead of at the very end of the semester and</td></tr>
</table>

				this topic will be a point of consideration in the evaluation of our current textbook.

Assessment Record

Program: **Biology (BIO 104)** **Assessment period:** **Fall 2016 –Summer 2019**

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Biology 104 Course Level Assessment Rubric:

General Education Objective

The student will demonstrate ability to apply reasoning and logic to assess ideas and situations, support positions, draw conclusions, and solve problems

The student will demonstrate understanding of mathematical concepts and scientific principles, and ability to use computers

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism level
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes

1. The student will recognize the fundamental principles and supporting evidence necessary to explain Darwinian evolution.
2. The student will demonstrate an ability to identify the structural characteristics and life cycles of both plant and animal phyla.
5. The student can recognize components of community ecology and identify how biodiversity contributes to a stable ecosystem.

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence		Use of Results
1. The student will recognize the fundamental principles and supporting evidence	Student learning outcomes were assessed using a 20 question multiple-choice assessment at	70% or > successful 69% or < unsuccessful The percent is based upon the	Jefferson	# students tested = 102 # correct = 555 % correct = 60%	The students tested did not meet the requirements for success for SLO 1.
			Shelby	# students tested = 95 # correct = 507	

necessary to explain Darwinian evolution.	the end of each semester. A total of 9 questions (Q1-Q6 and Q 18-20) were used to assess understanding of SLO1	average of correctly answered questions (1 to 6) related to SLO 1. (6 questions)	<table><tr><td></td><td>% correct = 59%</td></tr></table> **Total Students Tested = 197** **Total Success Rate = 60%**	The success rate for SLO 1 was 60% over the current 3 year review period. This is consistent with the last 3 year assessment period. We added more class discussion and review through the whole term on processes that were taught in the beginning of the semester. We will encourage course review throughout the term in the future.
2. The student will demonstrate an ability to identify the structural characteristics and life cycles of both plant and animal phyla.	Student learning outcomes were assessed using a 20 question multiple-choice assessment at the end of each semester. A total of 6 questions (Q7-Q12) were used to assess mastery of SLO2	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions (7 to 12 and 18 to 20) related to SLO 2. (9 total)	<table><tr><td>Jefferson</td><td># students tested = 102 # correct = 509 % correct = 83%</td></tr><tr><td>Shelby</td><td># students tested = 95 # correct = 355 % correct = 62%</td></tr></table> **Total Students Tested = 197** **Total Success Rate = 73%**	The students tested did meet the requirements for success for SLO 2. The success rate for SLO 2 Is 73% percent showing our students did master the topics covered under SLO 2. This represents an increase from 67% success found in our last 3 year review. We worked over the period to emphasize key topics throughout the semester. We will continue to reteach key topics and emphasize learning via class discussions.
3. The student can recognize components of population and	Student learning outcomes were assessed using a 20 question multiple-	70% or > successful 69% or < unsuccessful The percent is	<table><tr><td>Jefferson</td><td># students tested = 102 # correct = 323 % correct = 62%</td></tr></table>	The students tested did not meet the requirements for success for SLO 3.

community ecology and identify how biodiversity contributes to a stable ecosystem.	choice assessment at the end of each semester. A total of 5 questions (Q13-Q17) were used to assess mastery of SLO3	based upon the average of correctly answered questions (13 to 17) related to SLO 3. (5 total)	Shelby: # students tested = 95; # correct = 239; % correct = 50% **Total Students Tested = 197** **Total Success Rate = 57%**	The success rate for SLO 3 is 57% which is consistent with the success rate found during the previous 3 year review. We will work to include ecology topics throughout the semester to ensure the material is covered adequately.

Assessment Record

Program: **Biology (BIO 201)** **Assessment period:** **Fall 2016 – Summer 2019**

Program or Department Mission:

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters

Course Student Learning Outcomes & Assessment Plan

Biology 201 Course Level Assessment Rubric:

General Education Objective

The student will demonstrate ability to apply reasoning and logic to assess ideas and situations, support positions, draw conclusions, and solve problems

The student will demonstrate understanding of mathematical concepts and scientific principles, and ability to use computers

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels.
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes Assessed

1. Students will be able to identify the terminology used in anatomy and physiology
2. Students will be able to identify and recognize the distinct characteristics of the systems listed below
   - A. Integumentary System
   - B. Skeletal System
   - C. Muscular System
   - D. Nervous System
3. Students will recognize the relationship between structural organization and function
4. Student will define homeostasis and identify the role of homeostasis within and between appropriate systems
5. Students will identify the major structures of each system
   - A. Integumentary System
   - B. Skeletal System
   - C. Muscular System
   - D. Nervous System

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence	Use of Results

<table>
<tr>
<td>SLO 1:
Students will be able to identify the terminology used in anatomy and physiology</td>
<td>Student learning outcomes were assessed by using a 16 question standardized multiple choice examination at the end of the semester. A total of 2 questions (Q2 and Q3) were used to assess SLO1</td>
<td>Correct responses by 70% of the students for each SLO will be defined as a successful outcome.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 377
correct = 600
% correct = 80%</td></tr>
<tr><td>Shelby</td><td># students tested = 798
correct = 1343
% correct = 84%</td></tr>
<tr><td>Pell City</td><td># students tested = 208
correct = 298
% correct = 72%</td></tr>
<tr><td>Clanton</td><td># students tested =208
correct = 344
% correct = 83%</td></tr>
</table>
Total Students Tested = 1591
Total Success Rate = 81%
</td>
<td></td>
<td>The students tested did meet the requirements for success for SLO 1.

The success rate for SLO 1 is 81%, which is an improvement compared to the 66% reported in the last 3 year review. Instructors made a concerted effort to highlight terminology throughout the semester.

We will continue to use vocabulary terms throughout each chapter to reinforce the regional and directional terms. Faculty will emphasize the relationship between structure and function.</td>
</tr>
<tr>
<td>SLO 2: Students will be able to identify and recognize the distinct</td>
<td>Student learning outcomes were assessed by</td>
<td>Correct responses by 70% of the</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 377
correct = 1176
% correct = 78%</td></tr>
</table>
</td>
<td></td>
<td>The students tested did meet the requirements</td>
</tr>
</table>

<table>
<tr>
<td>characteristics of the systems listed below
A. Integumentary System
B. Skeletal System
C. Muscular System
D. Nervous System</td>
<td>using a 16 question standardized multiple choice examination at the end of the semester. A total of 4 questions (Q5, Q8, Q11, and Q14) were used to assess SLO2</td>
<td>students for each SLO will be defied as a successful outcome.</td>
<td>
<table>
<tr><td>Shelby</td><td># students tested = 798
correct = 2486
% correct = 78%</td></tr>
<tr><td>Pell City</td><td># students tested =208
correct = 489
% correct = 59%</td></tr>
<tr><td>Clanton</td><td># students tested =208
correct = 640
% correct = 77%</td></tr>
</table>
Total Students Tested = 1591
Total Success Rate = 75%
</td>
<td></td>
<td>for success for SLO 2.

The success rate for SLO 2 is 75% which represents and increase of 5% compared to the three-year program review. Faculty worked to incorporate the details and characteristics of each organ system throughout lecture and lab.

We will continue to stress the details of each organ system in both lecture and lab throughout the semester.</td>
</tr>
<tr>
<td>SLO 3: Students will recognize the relationship between structural organization and function</td>
<td>Student learning outcomes were assessed by using a 16 question standardized multiple choice examination at the end of the semester. A total of 4</td>
<td>Correct responses by 70% of the students for each SLO will be defied as a successful outcome.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 377
correct = 989
% correct = 66%</td></tr>
<tr><td>Shelby</td><td># students tested = 798
correct = 1827
% correct = 57%</td></tr>
<tr><td>Pell City</td><td># students tested =208
correct = 367
% correct = 44%</td></tr>
<tr><td>Clanton</td><td># students tested =208
correct = 457</td></tr>
</table>
</td>
<td></td>
<td>The students tested did not meet the requirements for success for SLO 3.

The success rate for SLO 3 over the three year period is 57% which represents a slight</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td>question (Q1, Q7, Q9, Q13) was used to assess SLO3</td>
<td></td>
<td>
<table>
<tr><td></td><td>% correct = 55%</td></tr>
</table>

Total Students Tested = 1591
Total Success Rate = 57%
</td>
<td></td>
<td>increase from the last three year study. We have worked to incorporate structure-function relationships across all content areas.

We will stress the relationship of structure and function in both lecture and lab for all organ systems covered. We will also supplement lecture content with activities and/or videos that emphasize the relationship between structure and function.</td>
</tr>
<tr>
<td>SLO 4: Student will define homeostasis and identify the role of homeostasis within and between appropriate systems</td>
<td>Student learning outcomes were assessed by using a 16 question standardized multiple choice examination at the end of the semester. A total of 2</td>
<td>Correct responses by 70% of the students for each SLO will be defied as a successful outcome.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 377
correct = 679
% correct = 90%</td></tr>
<tr><td>Shelby</td><td># students tested = 798
correct = 1399
% correct = 88%</td></tr>
<tr><td>Pell City</td><td># students tested =208
correct = 289
% correct = 69%</td></tr>
<tr><td>Clanton</td><td># students tested =208
correct = 349</td></tr>
</table>
</td>
<td></td>
<td>The students tested did meet the requirements for success for SLO 4.

The success rate for SLO 4 is 88% which is consistent across all semesters in</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td>questions (Q15 and Q16) were used to assess SLO4</td>
<td></td>
<td>
<table>
<tr><td></td><td>% correct = 84%</td></tr>
</table>
Total Students Tested = 1591
Total Success Rate = 85%
</td>
<td>this three year study and the previous three year study.

We will continue to stress the importance of homeostasis in each organ system.</td>
</tr>
<tr>
<td>SLO 5: Students will identify the major structures of each system
A.Integumentary System
B.Skeletal System
C.Muscular System
D.Nervous System</td>
<td>Student learning outcomes were assessed by using a 16 question standardized multiple choice examination at the end of the semester. A total of 4 questions (Q4, Q6, and Q10, Q12) were used to assess SLO5</td>
<td>Correct responses by 70% of the students for each SLO will be defied as a successful outcome.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 377
correct = 1321
% correct = 88%</td></tr>
<tr><td>Shelby</td><td># students tested = 798
correct = 2540
% correct = 80%</td></tr>
<tr><td>Pell City</td><td># students tested =208
correct = 581
% correct = 70%</td></tr>
<tr><td>Clanton</td><td># students tested =208
correct = 604
% correct = 73%</td></tr>
</table>
Total Students Tested = 1591
Total Success Rate = 79%
</td>
<td>The students tested did meet the requirements for success for SLO 5.

The success rate for SLO 5 is 79% and is consistent with data from the previous three year study.

We will continue to emphasize the major structures of each organ system and focus on the relationship between structure and function.</td>
</tr>
<tr><td colspan="2"></td><td colspan="2"></td></tr>
</table>

Assessment Record

Program: Biology (BIO 202) **Assessment period:** Fall 2016- Summer 2019

Program or Department Mission:

Program or Department Mission:
The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Biology 202 Course Level Assessment Rubric:

General Education Objective

The student will demonstrate ability to apply reasoning and logic to assess ideas and situations, support positions, draw conclusions, and solve problems

The student will demonstrate understanding of mathematical concepts and scientific principles, and ability to use computers

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels.
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes Assessed

1. Students will define and describe the systems listed below.
   A. Endocrine System
   B. Cardiovascular System
   C. Lymphatic and Immune System
   D. Respiratory System
   E. Digestive System
   F. Urinary System
   G. Reproductive System
2. Students will define homeostasis and identify the role of homeostasis within and between appropriate systems.
3. Students will be able to recognize the major structures of each system listed below.
   A. Endocrine System
   B. Cardiovascular System
   C. Lymphatic and Immune System
   D. Respiratory System
   E. Digestive System
   F. Urinary System
   G. Reproductive System

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence		Use of Results
1: Students will define and describe the systems listed below. A. Endocrine System B. Cardiovascular System C. Lymphatic and Immune System D. Respiratory System E. Digestive System F. Urinary System	Student learning outcomes were assessed by using a 12 question standardized multiple choice examination at the end of the semester. A total of five questions (Q2,	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO 1.	Jefferson	# students tested = 461 # correct = 1848 % correct = 80%	The students tested did meet the requirements for success for SLO 1. The success rate for SLO 1 was 73% over the three-year period. This represents and
			Shelby	# students tested = 772 # correct = 2789 % correct = 72%	
			Pell City	# students tested =177 # correct = 606 % correct = 68%	
			Clanton	# students tested =266 # correct = 911 % correct = 68%	

<table>
<tr>
<td>G. Reproductive System</td>
<td>Q4, Q7, Q8, Q12) were used to assess SLO1.</td>
<td></td>
<td>Total Students Tested = 1676
Total Success Rate = 73%</td>
<td>increase from 61% over the previous 3-year program review. Concerted efforts were made over this current review period to incorporate case studies to facilitate a complete understanding of the various organ systems.

We will continue to reinforce the various organ systems in both lecture and lab.</td>
</tr>
<tr>
<td>2: Students will define homeostasis and identify the role of homeostasis within and between appropriate systems.</td>
<td>Student learning outcomes were assessed by using a 12 question standardized multiple choice examination at the end of the semester. A total of 2 questions (Q1 and Q6) were used to assess SLO2.</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO2.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 461
correct = 820
% correct = 89%</td></tr>
<tr><td>Shelby</td><td># students tested = 772
correct = 1279
% correct = 83%</td></tr>
<tr><td>Pell City</td><td># students tested =177
correct = 247
% correct = 70%</td></tr>
<tr><td>Clanton</td><td># students tested =266
correct = 338
% correct = 64%</td></tr>
</table>
Total Students Tested = 1676
Total Success Rate = 80%
</td>
<td>The students tested did meet the requirements for success for SLO 2.

The success rate for SLO 2 is 80% which is consistent with the data collected during the previous program review period. Homeostasis is stressed in both</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td>201 and 202 and throughout every chapter. This is an underlying theme across all sections taught.

We will continue to stress the importance of homeostasis in each chapter and with each organ system.</td></tr>
<tr><td>3: Students will be able to recognize the major structures of each system listed below.
A. Endocrine System
B. Cardiovascular System
C. Lymphatic and Immune System
D. Respiratory System
E. Digestive System
F. Urinary System
G. Reproductive System</td><td>Student learning outcomes were assessed by using a 12 question standardized multiple choice examination at the end of the semester. A total of 5 questions (Q3, Q5 and Q9-Q11) were used to assess SLO3.</td><td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO3.</td><td><table><tr><td>Jefferson</td><td># students tested = 461
correct = 2051
% correct = 89%</td></tr><tr><td>Shelby</td><td># students tested = 772
# correct = 3248
% correct = 84%</td></tr><tr><td>Pell City</td><td># students tested =177
# correct = 653
% correct = 70%</td></tr><tr><td>Clanton</td><td># students tested =266
# correct = 1051
% correct = 79%</td></tr></table>
Total Students Tested = 1676
Total Success Rate = 84%</td><td>The students tested did meet the requirements for success for SLO 3.

The success rate for SLO 3 is 84% which is an increase from the 75% success rate reported in the previous 3-year program review. Efforts have been made across the campuses to increase the quality and number of models in BIO 202.</td></tr>
</table>

				We will continue to teach organ system identification in the lab.

Assessment Record

Program: **Biology (BIO 220)** **Assessment period:** **Fall 2016- Summer 2019**

Program or Department Mission:
The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Outcomes & Assessment Plan

Biology 220 Course Level Assessment Rubric:

General Education Objective

The student will demonstrate ability to apply reasoning and logic to assess ideas and situations, support positions, draw conclusions, and solve problems

The student will demonstrate understanding of mathematical concepts and scientific principles, and ability to use computers

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.

2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels.
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes Assessed

1. Students will be able to identify the differences between prokaryotic and eukaryotic cells as well as the structure and function of microorganisms in various environments.
2. Students will recognize the metabolic and genetic pathways in microorganisms as well as the clinical and industrial applications of these properties.
3. Students will be able to identify the relationship between microorganism infection and disease, interactions with the host immune system, and various methods for controlling the growth and dissemination of microorganisms.
4. Students will be able to recognize proper laboratory technique and protocols including aseptic technique, media selection, slide preparation, and microscopy.

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence	Use of Results
1. Students will be able to identify the differences between prokaryotic and eukaryotic cells as well as the structure and function of microorganisms in various environments.	Student learning outcomes were assessed by using a 13 question standardized multiple choice examination at the end of the semester. A total of two questions (Q1 and Q2) were used to assess SLO-1.	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO-1.	Jefferson: # students tested = 542; # correct = 789; % correct = 73% Shelby: # students tested = 528; # correct = 463; % correct = 44% Pell City: # students tested =117; # correct = 133; % correct = 57% Clanton: # students tested =134; # correct = 131; % correct = 50%	The students tested did not meet the requirements for success for SLO 1. The success rate for SLO 1 was 57%. Though it was a slight increase from the previous three year program review (55%) it did not meet the projected mark. It should be noted again that students are not required

<table>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total Students Tested = 1321
Total Success Rate = 57%</td>
<td>to take BIO 103 as a prerequisite for BIO 220 and are therefore lacking foundational knowledge in biology.

We will continue to emphasize the differences between prokaryotic and eukaryotic cells throughout the semester. As noted previously, some instructors also administer quizzes on comparing the two cell types; where others provide worksheets.

We will work to provide the students with a fundamental knowledge of foundational biology concepts</td>
</tr>
<tr>
<td>2. Students will recognize the metabolic and genetic pathways in microorganisms as well as the clinical and industrial applications of these properties.</td>
<td>Student learning outcomes were assessed by using a 13 question standardized multiple choice examination at the end of the semester. A total of three questions (Q3 - Q5) were used to assess SLO-2.</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO-2.</td>
<td>
<table>
<tr><td>Jefferson</td><td># students tested = 542
correct = 1298
% correct = 80%</td></tr>
<tr><td>Shelby</td><td># students tested = 528
correct = 1169
% correct = 74%</td></tr>
<tr><td>Pell City</td><td># students tested =117
correct = 280
% correct = 80%</td></tr>
<tr><td>Clanton</td><td># students tested =134
correct = 237
% correct = 59%</td></tr>
</table>
Total Students Tested = 1321
</td>
<td>The students tested did meet the requirements for success for SLO 2.

The success rate for SLO 2 was 75% which was consistent with the data from the previous 3 year program review.

We will continue to illustrate how the metabolic and genetic</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>Total Success Rate = 75%</td><td>pathways relate to the activities at hand during laboratory exercises.</td></tr>
<tr><td>3. Students will be able to identify the relationship between microorganism infection and disease, interactions with the host immune system, and various methods for controlling the growth and dissemination of microorganisms.</td><td>Student learning outcomes were assessed by using a 13 question standardized multiple choice examination at the end of the semester. A total of two questions (Q6 and Q7) were used to assess SLO-3.</td><td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO-3.</td><td><table><tr><td>Jefferson</td><td># students tested = 542
correct = 979
% correct = 90%</td></tr><tr><td>Shelby</td><td># students tested = 528
# correct = 984
% correct = 93%</td></tr><tr><td>Pell City</td><td># students tested =117
# correct = 173
% correct = 74%</td></tr><tr><td>Clanton</td><td># students tested =134
# correct = 225
% correct = 84%</td></tr></table>Total Students Tested = 1321
Total Success Rate = 89%</td><td>The students tested did meet the requirements for success for SLO 3.

The success rate for SLO 3 was 89% which is consistent with the previous three year program review.

We will continue to emphasize content related to infectious diseases during lecture and lab sessions.</td></tr>
<tr><td>4. Students will be able to recognize proper laboratory technique and protocols including aseptic technique, media selection, slide preparation, and microscopy.</td><td>Student learning outcomes were assessed by using a 13 question standardized multiple choice examination at the end of the semester. A total of 6 questions (Q8 – Q13) were used to assess SLO-4.</td><td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO-4.</td><td><table><tr><td>Jefferson</td><td># students tested = 542
correct = 2870
% correct = 88%</td></tr><tr><td>Shelby</td><td># students tested = 528
# correct = 2571
% correct = 81%</td></tr><tr><td>Pell City</td><td># students tested =117
# correct = 537
% correct = 76%</td></tr><tr><td>Clanton</td><td># students tested =134
# correct = 655
% correct = 81%</td></tr></table>Total Students Tested = 1321
Total Success Rate = 84%</td><td>The students tested did meet the requirements for success for SLO 4.

The success rate for SLO 4 was 84% which was consistent with the data from the previous 3 year program review.

We will continue to emphasize the proper laboratory techniques and protocols throughout the semester.</td></tr>
<tr><td colspan="3"></td><td></td><td></td></tr>
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