

# ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

ACADEMIC YEAR 2017-2018



**PROGRAM/DIVISION:** Natural Science/Math/Computer Science      **NAME OF ASSESSMENT LEAD: Professor: Lisa Jackson**

**BROAD INSTITUTIONAL GOALS SUPPORTED BY PLOS**

(Check all that apply)

- |                                     |  |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | BIG 1 - Qualitative academic program                                 |
| <input type="checkbox"/>            | BIG 2 - Competent Faculty & Staff with opportunities for development |
| <input type="checkbox"/>            | BIG 3 - Enhanced Enrollment Management                               |
| <input type="checkbox"/>            | BIG 4 - Expand and stabilize the financial resources of the college  |
| <input type="checkbox"/>            | BIG 5 - Fiscal Stability & Financial Management                      |
| <input type="checkbox"/>            | BIG 6 - Physical Plant/Grounds – Ensure adequacy & quality           |
| <input type="checkbox"/>            | BIG 7 - Public service & Visibility                                  |
| <input type="checkbox"/>            | BIG 8 - Student Access via Financial Aid                             |
| <input type="checkbox"/>            | BIG 9 - Academic support Services/Research                           |
| <input type="checkbox"/>            | BIG 10 Governance  |

**INSTITUTIONAL STUDENT LEARNING OUTCOMES SUPPORTED BY PLOS**

(Check all that apply)

- |                                     |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | ILO- 1 Communication                        |
| <input checked="" type="checkbox"/> | ILO-2 Critical Thinking                     |
| <input checked="" type="checkbox"/> | ILO-3 Information & Technology Literacy     |
| <input type="checkbox"/>            | ILO-4 Global Awareness & Cultural           |
| <input type="checkbox"/>            | ILO-5 Quantitative Literacy                 |
| <input checked="" type="checkbox"/> | ILO-6 Scientific Literacy                   |
| <input type="checkbox"/>            | ILO-7 Personal Responsibility & Development |
| <input type="checkbox"/>            | ILO-8 Spiritual Insights & Values           |

**PROGRAM/DIVISION MISSION STATEMENT:**

The Mission/Purpose of the Natural Science, Mathematics, & Computer Science Division is to support the Mission of the college by equipping students with core competencies for Quantitative, Scientific, and Information Systems literacy in preparation for transfer to upper division colleges/universities or the job market.

# ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

## PROGRAM LEVEL GOALS MAPPED TO STUDENT LEARNING OUTCOMES & CURRICULUM

<b>Program Level Student Learning Goal (s)</b> 	<b><u>Program Level Goal-1</u></b> Graduates/Completers will demonstrate a knowledge of living systems and the physical universe  <b>PLO2</b> Graduates will be able to articulate basic biological concepts and phenomena as manifested in plants, anatomy, physiology, cell- or biochemistry.	<b><u>Program Level Goal-2</u></b> Graduates/completers will demonstrate competency in fundamental mathematical skills.  <b>PLO3</b> Graduates will apply mathematical concepts, principles and methods to solve problems or analyze scenarios in real-world contexts.	<b><u>Program Level Goal-3</u></b> Graduates/Completers will utilize the tools of technology to expand accessibility to educational and job opportunities.  <b>PLO4</b> Graduates will design solutions utilizing computer systems.
<b>Program Level Student Learning Outcome (s)</b> 			
<b>Courses Within the Natural Science/Math/Computer Science Curriculum</b> 			
<b>BIO 141 General Biology</b>	<b>I</b>		
<b>BIO 142 General Biology II</b>	<b>R</b>		
BIO 241 Anatomy & Physiology I	<b>R</b>		
BIO 243 Anatomy & Physiology II	<b>R</b>		
CHM 141 General Chemistry I	<b>I</b>		
CHM 142 General Chemistry II	<b>R</b>		<b>6644</b>
MTH 135 College Algebra		<b>I,R</b>	
MTH 136 Trigonometry		<b>R</b>	
MTH 137 Elementary Statistics		<b>R</b>	
MTH 233 Analytical Geometry		<b>R</b>	
MTH 235 Calculus I		<b>R</b>	

## ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

MTH 236 Calculus II		<b>R</b>	
CS 128 Introduction to the Internet			<b>I</b>
CS 131 Introduction to Computer Science			<b>I,R</b>
CS 133 Web Design & Scripting			<b>I,R</b>

*(I=Introduced; R=Reinforced; M=Mastery)*

### Program Level Student Learning Outcomes Mapped to Assessment Measures, Criteria for success, Findings, Use of Results (Action Plan)

Program Level Learning Outcome	Methodology of Assessment	Criteria for Success	Assessment Results	Use of Results to Improve Outcomes (Action Plan)
<p style="text-align: center;"><b>PLO1</b></p> <p>Graduates will be able to articulate basic biological concepts and phenomena as manifested in plants, anatomy, physiology, cell- or biochemistry</p>	<p style="text-align: center;"><b><u>Methodology</u></b></p> <p><b>1. <u>Direct Measure</u></b>            BIO 141 &amp; BIO 142  <b>Essay Assignment</b> – Spring, 2018            Student will write an essay comparing/contrasting selected body systems and or organisms.</p>	<p style="text-align: center;"><b><u>Criteria for Success</u></b></p> <p>Students assessed were expected to meet college-level academic standards on an 8 Primary Trait Scoring Rubric. 70% of the students is expected to score 3 or better on a 4 point scale Scoring Rubric            Primary traits were: 1) Purpose &amp; Focus            2) Development on Topic,            3) Relative Support for Topic/Content 4) Organization            5) Sentence Structure, 6) Language, 7) Grammar, 8) Citations.</p>	<p style="text-align: center;"><b><u>Results of Assessment</u></b></p> <p>Number Assessed: 60  <u>Target Not Met.</u>            Less than 30% from both Biology sections met the criteria for success..            Strengths: None            Weaknesses:</p> <ul style="list-style-type: none"> <li>• Superficial discussion of subject</li> <li>• Lack of Focus</li> <li>• Poor Organization</li> <li>• No support for main ideas</li> <li>• Poor mechanics</li> </ul>	<p style="text-align: center;"><b><u>Use of Results</u></b></p> <p><b>Based upon assessment results,</b></p> <ul style="list-style-type: none"> <li>• The division currently require “Early Alert” Formative assessments of writing competencies for all division classes and refer students requiring remediation to the <b>Center for Student Success</b> for one-on-one and group tutoring, counseling, and guidance.</li> <li>• Use Criterion (ETS web-based Writing</li> </ul>

ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

				<p>Evaluation Tool) to provide students 24/7 one-on-one access to immediate feedback on writing. Within 20 seconds after a writing sample is submitted electronically, the student receive a report and analysis of the quality of the paper. The student is directed to instruction in the Writer’s Handbook on each occurrence of the error. The student can make multiple submissions and see incremental improvement in scores. (Current Term)</p> <ul style="list-style-type: none"> <li>• All faculty of the division is being trained in the use of Schoology, ,a new LMS, that has great</li> </ul>
--	--	--	--	---

## ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

	<p><b>2. <u>Assessment Tool</u></b>                  Direct Measure                  Comprehensive                  Biology Final                  Exam – Spring,                  2017                  Selected Response</p>	<p><b><u>Criteria for Success</u></b>  <b>70% of students will                  score 70% or better of                  Selected Response (SR)                  Questions</b></p>	<p><b><u>Assessment Results</u></b>                  Target .=Met                  70% of students scored 70% or                  better.  <b><u>Conclusions Drawn:</u></b>                  Students are performing at the                  marginally proficient level because</p>	<p>“mastery”                  functionality and                  differentiation                  capabilities.. BIO 141                  &amp; BIO 142 will be set                  up to be used Fall,                  2018 for.                  Supplemental                  Instruction.</p> <ul style="list-style-type: none"> <li>• Division has                      proposed to the                      Faculty Curriculum                      that the college                      require successful                      completion of a                      college level English                      composition course as                      a pre-requisite for                      Biology 141/142,                      Fall, 2017</li> </ul> <p><b><u>Use of Assessment Findings</u></b>                  Based upon assessment                  results, the division</p> <ul style="list-style-type: none"> <li>• <b>Proposes to the                      Faculty Senate that                      Professors be</b></li> </ul>
--	--	---	--	--

## ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

	<p>Questions Locally prepared by professor using test bank from textbook publisher. .DoK (Depth of Knowledge) Range 1-5</p>		<p>they do not purchase the required textbook nor use the textbook website for tutorials. They complain about the price of the textbook; however, the students are not taking advantage of textbook rentals or ebooks.</p>	<p><b>allowed to drop students from classes for which they do not have required learning materials per the class syllabus.</b></p> <ul style="list-style-type: none"> <li>• <b>Further, that an “Emergency” Loan Fund be established to assist students who can demonstrate financial Need in excess of Federal Financial Aid Awards</b></li> <li>• <b>Provide more transparency in course requirements by having the course outline, Learning outcomes per topic, and assignments a part of the syllabus given to the student the 1<sup>st</sup> day of class.</b></li> <li>• <b>Utilize the</b></li> </ul>
--	---	--	--	--

**ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT**

				<p><b>functionality of Schoology (LMS) to provide varied learning resources and multiple opportunities for formative assessment (quizzes, forum discussions) Continuous feedback will guide the student incrementally toward targeted expectations.</b></p> <ul style="list-style-type: none"> <li>• <b>Continue Schoology InService Training to become more proficient in the use of all of its tools for enhancing student/learning activities and assessment.</b></li> <li>• <b>Each division faculty encouraged to join the Professional Development group</b></li> </ul>
--	--	--	--	---

## ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

				<b>on Schoology.</b>
<p><b>PLO2</b> Graduates will apply mathematical concepts, principles and methods to solve problems or analyze scenarios in real-world contexts.</p>	<p><b><u>Assessment Tool</u></b> Locally Prepared Comprehensive Exam, Spring, 2018 MTH 135, College Algebra 30 questions covering algebra concepts, equations and functions. Time Allotted: 1 1/2 hours. Administered to 2 sections of MTH 135</p>	<p><b><u>Criteria for success</u></b> 70% of students assessed were expected to achieve a minimum score of 70%</p>	<p><b><u>Assessment Re results</u></b> <b>Target Met – 71%</b> Number of students enrolled= 28 Number of students assessed =23 <b>MAX =93%</b> <b>MIN = 0%</b> <b>AVER = 71%</b></p>	<p><b><u>Use of Results</u></b> Basic upon assessment findings, the division proposes the following;</p> <ul style="list-style-type: none"> <li>• Moving forward - apply intensive teaching on equations, inequalities, functions, and how to accurately communicate solution to problems and concepts. Continue frequent assessment and enhancement of teaching strategies.</li> <li>• Require students in all mathematics classes to purchase text books prescribed for each class. (Serious enforcement necessary) Consider dropping students who do not have</li> </ul>

## ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

				<p>required text and supplies..</p> <ul style="list-style-type: none"> <li>• Increase time to take major exams and quizzes.</li> <li>• Require Mathematics faculty to attend at least one workshop or webinar in order to explore enhanced teaching methodologies.</li> </ul>			
<p><b>PLO3</b> Graduates will design solutions utilizing computer systems.</p>	<p><b><u>Assessment Tool</u></b> Game Simulation Capstone Project Students will be required to apply knowledge and skills learned within the program to create a teaching/learning game. This is a favored Signature Assignment project that has been used for several years and always engages the students. Fall, 2016 CS 131 1 CS 131 2 CS 131 3</p>	<p><b><u>Criteria for Success</u></b> 80% of the students will demonstrate Proficiency on a 5 point scale from Advanced Proficiency down to Not Proficient. during observation of the game in play as well as a review of the written design. <b>7 Primary Traits Scoring Rubric used.</b></p> <ol style="list-style-type: none"> <li>1) Design document</li> <li>2) Methods</li> <li>3) Variables</li> <li>4) Functions</li> <li>5) Test &amp; Debug</li> <li>6) Documentation</li> <li>7) Creativity.</li> </ol>	<p><b><u>Assesment Results</u></b> <b>Target Met - 80% demonstrated Proficiency &amp; Marginally Proficient competencies</b> <b># in Class = 57</b> <b>Withdrew = 7</b> <b>N Assessed = 50</b> <b>Advanced – 0%</b> <b>Proficient =19 (38%)</b> <b>Marginally Proficient 21 (42%)</b> <b>Not Proficient = 10 (20%)</b> <b>While not any students demonstrated Advanced proficiency for Fall, 2017, fewer students scored in the “Needs Improvement” range as compared to the most recent two years of using this assignment.</b></p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td><b>Competencies</b></td> <td><b>2016</b></td> <td><b>2015</b></td> </tr> </table>	<b>Competencies</b>	<b>2016</b>	<b>2015</b>	<p><b><u>Use of Results</u></b> Based upon assessment findings:</p> <ul style="list-style-type: none"> <li>• The division acknowledges that students connect better in learning environments that stimulator curiosity and challenge assumptions, faculty will continue to explore authentic learning experiences that guide students as they learn to think</li> </ul>
<b>Competencies</b>	<b>2016</b>	<b>2015</b>					

## ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

					<b>2017</b>	<b>2016</b>	
				<b>Exceeds Expectation</b>	34.62%	23.07%	Creatively, reason systematically, and work collaboratively in preparation for higher education or join the workforce. <ul style="list-style-type: none"> <li>• Study the feasibility of providing opportunities for computer science students to learn within a “real world culture” by creating or designing games/simulations as learning support tools for courses across the campus.</li> </ul>
				<b>Meets Expectation</b>	30.77%	15.38%	
				<b>Needs Improvement</b>	34.62%	61.2%	

### INITIATIVES FOR NEXT CYCLE WITH BUDGETARY IMPLICATIONS

**An increased supply budget of \$12,000 for the division can provided much needed laboratory models and supplies.**

# ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

## FOLLOWUP REPORT ON PREVIOUS CYCLE ACTION PLAN

Prior Period Learning Outcomes	Select Actions taken based on Prior Year Results (Select all that apply)				Describe Actions Taken Based upon Prior Year Results
<p><b>Prior period carry over issues had to do with;</b></p> <ol style="list-style-type: none"> <li>1. Addressing concerns about plagiarism; especially as noticed in the Humanities and BIO 141/142 Essays.</li> <li>2. More Formative Assessments in order to give faculty opportunity to make needed changes and modification in teaching/learning activities, strategies prior to summative assessments.in order to increase student learning</li> <li>3. Length of Exams Issues.</li> <li>4. Question regarding time used to create games/simulations.</li> </ol>	<p>Curriculum Change <input type="checkbox"/></p> <p>Course Revision <input checked="" type="checkbox"/></p> <p>Pedagogical Change <input checked="" type="checkbox"/></p> <p>Stakeholders Feedback <input type="checkbox"/></p> <p>Co-curricular Opportunities <input type="checkbox"/></p> <p>Academic Support/Advising <input checked="" type="checkbox"/></p>	<p>Assessment Methods <input type="checkbox"/></p> <p>Financial Resources <input checked="" type="checkbox"/></p> <p>Services Change <input type="checkbox"/></p> <p>General Resources <input checked="" type="checkbox"/></p> <p>Human Resources <input type="checkbox"/></p> <p>Other <input type="checkbox"/></p>	<p><b>1.1 A module on How to Avoid Plagiarism is now a standard in Freshmen Orientation classes.</b></p> <p><b>1.2 Faculty is encouraged to include the Academic Integrity Policy in the class syllabus.</b></p> <p><b>1.3 Faculty is encouraged to se a free plagiarism checker on the internet</b></p> <p><b>2.1The college is considering including a subscription for Turnitin or Grammarly for Spring, 2019 if not sooner.</b></p> <p><b>3.1ampus wide initiation of the Early Alert Test around the 4<sup>th</sup> or 5<sup>th</sup> week of classes.</b></p> <p><b>4.1 Discussions in Faculty In Service addressed the completeness of Exams. Suggested that faculty create a Test Blue Print to assure that test questions and Student Learning Outcomes from the syllabus are aligned. Additionally, that each faculty member be very intentional about</b></p>		

# ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

---

		<p><b>the DoK concern. Challenge the students toward higher order thinking skills.</b></p> <p><b>4.1 Faculty discussions basically led to a consensus that the benefits derived are greater than the costs incurred. When that scenario is reversed, that will be time enough to make changes based upon “expressed need.”</b></p>
--	--	--

## **EXECUTIVE SUMMARY**

The 2017-2018 outcomes addressed were a continuation of the previous year. While the average GPA in Biology decreased from the previous year, overall GPAs in math, and computer science were similar to the previous years. All average GPAs were below 3.00. These statistics indicate that more needs to be done to enhance student learning.

To ameliorate student learning, it is recommended that instructors in the biology, math, computer science department attend staff development sessions that expand their skills in teaching “at-risk” students. Literature suggests that the better our teachers are equipped to teach, the better they will be able to provide exciting educational experiences and thus, improve academic achievement of their students.

Staff development on teaching strategies is also recommended. A differentiated classroom is very important for the “at-risk” student. It is also recommended that the biology, mathematics, and computer science department use external assessment tools as well as other direct and indirect measures for assessment. Many of the students enrolled in college algebra transferred from developmental math classes. Responses from the Curriculum Study Questionnaire (CSQ) reveal that just over a third of current students agree or strongly agree that *SwCC’s developmental math provided me good preparation for my subsequent math course* (37%). This statistic as well as student GPAs in math indicate a need for effective collaboration of the curriculum between those who teach developmental courses in math and those who teach college algebra.

## **STUDENT SATISFACTION SURVEY**

## ANNUAL INSTITUTIONAL EFFECTIVENESS REPORT

---

**Program Operational Outcome: 75% of Graduates/Completers will express satisfaction with the faculty, classes, instruction, program and services of the Social Science Division.**

**All students in all Natural Science, Math, & Computer Science classes were asked the following question at the end of each class:**

1. Student learning activities in this class were clearly aligned with expected student learning outcomes listed in the class syllabus that you received at the beginning of the class.
2. Course exams or other assessment activities covered the subject matter content covered in assigned reading, class lectures, or other teaching/learning activities.
3. This class has prepared me for upper level classes in this discipline or with transferable knowledge, skills, or behaviors for the world of work.

**They were instructed to answer:** 1) Strongly Agree 2) Agree 3) Strongly Dis Agree 4) Dis Agree 5) No Opinion

**Findings:** 72% of all respondents responded **Strongly Agree or Agree**