**Sinclair Community College**

**Continuous Improvement Annual Update 2013-14**

**Please submit to your dean and the Provost’s Office no later than Oct. 1, 2013**

**Department:** 0322 – Biology

Year of Last Program Review: FY 2012-2013

Year of Next Program Review: FY 2017-2018

**Section I: Department Trend Data, Interpretation, and Analysis**

**Degree and Certificate Completion Trend Data – OVERALL SUMMARY**

Please provide an interpretation and analysis of the Degree and Certificate Completion Trend Data (Raw Data is located in Appendix A*): i.e. What trends do you see in the above data? Are there internal or external factors that account for these trends? What are the implications for the department? What actions have the department taken that have influenced these trends? What strategies will the department implement as a result of this data?*

With the exception of FY 09-10 in the review, the trend for completion, etc has been steady. The department had an increase in year 12-13, in part due to the departments push for a developed two plus two program (s) in bio and biotech with Wright State University. Even though it officially begins this year, students "jumped" at the chance to complete the process.

Externally, the increase in part is also due to the current USA administrations push for degree completion in 2 year college setting.

The department has taken numerous steps to try and continue the upward swing in degree completion. These include word of mouth discussions with our students in these degree pathways, increased work with TechPrep, increased outreach in local HS and the community, and increased class offerings.

**Course Success Trend Data – OVERALL SUMMARY**

Please provide an interpretation and analysis of the Course Success Trend Data (Raw Data is located in Appendix A). Looking at the success rate data provided in the Appendix for each course, please discuss trends for high enrollment courses, courses used extensively by other departments, and courses where there have been substantial changes in success.

The majority of the classes within the biology department either maintained a similar level of success as seen in the quarter system. Some decrease in success was seen in classes that were considered the "first" part of a series and then combined with half of the second quarter. An example would be Bio 1141 (Bio 141 and 1/2 of Bio 142). As a whole, the department will continue to monitor the success rates of these classes and evaluate methods and modes of educational delivery. Below shows the growth of BIO 1141 and 1242 the last few of years.

Semester # of students 1141 & 1242

11/FA 257

12/WI 405

12/SP 352

12/FA 660

13/SP 995

13/FA 781

Classes in biotechnology seemed to maintain similar levels of success as seen in the quarter system. The department is especially proud of the increase in BTN 1130 (130) success rate, as this class is considered a "gatekeeper" course for BTN students. This increase is in part due to the faculty commitment to increase math retention within the class. Below shows the growth of

our BTN program the last few years.

Semester # of BTN Students

11/FA 13

12/WI 40

12/SP 20

12/FA 25

13/SP 149

Please provide any additional data and analysis that illustrates what is going on in the department (examples might include accreditation data, program data, benchmark data from national exams, course sequence completion, retention, demographic data, data on placement of graduates, graduate survey data, etc.)

The department has developed 2 two plus two programs with WSU. The AS.EMPH in biology will allow the students to complete their first two years of biology at Sinclair Community College. The BTN.AS program will allow biotechnology students to complete their degree at Sinclair Community College and then continue on at WSU in the BS in biology pathway. It is our hope as a department that we will see an increase in associate degree completion in these two areas. Biology has over a 100 current students in the first part of the biology majors class (1171), so in two years we will have solid data to use for degree completion. Below shows the growth of BIO 1171 and BIO 1272 the last few of years.

Semester # of students BIO 1171

11/Fall 30

12/Fall 143

13/Fall 202

Semester # of students BIO1272

12/WI 27

13/SP 136

14/SP 169

**Section II: Progress Since the Most Recent Review**

Below are the goals from Section IV part E of your last Program Review Self-Study. Describe progress or changes made toward meeting each goal over the last year.

|  |  |  |
| --- | --- | --- |
| **GOALS** | **Status** | **Progress or Rationale for No Longer Applicable** |
| As our administration continues to define the goals for Sinclair at the YMCA and Warren County sites, the Biology department is committed to providing course offerings that support these efforts. The ability to offer hybrid classes at these YMCA/Warren county sites has saved the college $60,000 per location. | In progress  Completed  No longer applicable | Completed, the department offers numerous hybrid classes to meet the needs of the students at these various locations |
| At this time, our primary goal is to meet the established enrollment demand for Top 45 biology courses (and the semester versions), namely BIO 107 (1107)Human Biology, BIO 141-143 (1141/1242)Human Anatomy and Physiology I- III, BIO 111-113 (1111/1211) General Biology I-III (for non-majors). No new courses are planned at this time, as some were removed from the “books” in semester conversion. | In progress  Completed  No longer applicable | Completed |

Below are the Recommendations for Action made by the review team. Describe the progress or changes made toward meeting each recommendation over the last year.

|  |  |  |
| --- | --- | --- |
| **RECOMMENDATIONS** | **Status** | **Progress or Rationale for No Longer Applicable** |
| While the department did an outstanding job of articulating which activities in programs and courses address each of the General Education outcomes, no data was provided regarding how well students are performing on these measures. The department has already laid the groundwork for increased assessment by identifying activities, it is recommended that the department take the next step in assessment and begin collecting, aggregating, and analyzing data from these activities so that the department can demonstrate students are achieving these outcomes. | In progress  Completed  No longer applicable | Five year review in spring of 2013, so work has just begun on recommendations |
| The current program outcomes for BIOE.S.AS were developed at a time when the degree was an emphasis area in Liberal Arts and Sciences. Now that the program has come into its own as an independent degree, additional outcomes should be developed that target BIO specifically. The existing outcomes can be kept, but they should be enhanced with additional targeted outcomes for BIO, and activities should be identified that are associated with these new outcomes similar to the specific activities have been identified that are associated with the current outcomes. Developing a small number of additional outcomes will be crucial to helping the BIOE.S.AS program develop its own identity as an independent program, rather than just as one option among many for Liberal Arts and Sciences program students. The department is encouraged to seek support from the division learning liaison in developing program outcomes and a system for collecting, analyzing and using outcomes data to improve the program. | In progress  Completed  No longer applicable | Five year review in spring of 2013, so work has just begun on recommendations |
| Efforts were initially begun to articulate credit from the non-credit Biotechnology offerings that the department has developed with Workforce Development. The review team recommends that these efforts be pursued to completion to give students participating in non-credit education a head start on earning a credit-bearing credential. Having this may enable the department to recruit more students into the Biotechnology program. | In progress  Completed  No longer applicable | The department is working with workforce development, PLTW, and Tech prep to investigate articulated credit. |
| The department is encouraged to bolster its collection and use of data, particularly in regards to transfer and employment of graduates. Research, Analytics, and Reporting (RAR) has access to National Student Clearinghouse data that can provide comprehensive data on where students transfer to and what degrees they receive at their transfer institutions. In addition, RAR has access to Ohio Department of Job and Family Services data that can provide data on employment of graduates, which may be particularly beneficial for the Biotechnology students. Finally, RAR may be able to help find ways to document the benefits of the excellent work that is done helping students in the B.I.O.S.I.S. lab. | In progress  Completed  No longer applicable | Five year review in spring of 2013, so work has just begun on recommendations |
| Are there opportunities to move some of the resources provided in the B.I.O.S.I.S. lab into an online format so that students located some distance from campus who are taking online sections could benefit from these resources? | In progress  Completed  No longer applicable | BIOSIS is based on the campus, while students who take our classes are online. That being said, each angel shell tells the student(s) about using BIOSIS if they are local. |
| The department has experienced increased enrollment in recent years, and with the push nationally and regionally for more education in STEM areas, and with the possibility that more companies requiring STEM-educated employees will be moving into the area, it is important that the department monitor potential employment demand and the impact that might have on enrollment. If enrollment increases look likely, the department may need to be thoughtful and strategic in determining how those increased demands may be met, particularly in light of constraints of space and equipment. Some course offerings may need to be prioritized over others in the future, resources within the department may need to be shifted around, and options for increasing lab capacities may need to be considered, along with any other strategies that might be implemented to increase student capacity. | In progress  Completed  No longer applicable | Five year review in spring of 2013, so work has just begun on recommendations |
| Section IV.E of the self-study report addresses goals for the program, and the only goals listed were providing support for institutional goals and meeting increased enrollment demand. The department should give some thought to what other goals might be appropriate – where does the department see itself in five years? Ten years? What goals and related infrastructure will need to be put in place to get there? | In progress  Completed  No longer applicable | Five year review in spring of 2013, so work has just begun on recommendations |
| The department should monitor employment opportunities in Biotechnology carefully to determine whether we are offering the appropriate degree level to meet employment needs – if fewer jobs become available at the associate degree level and more jobs require higher levels of education, it may be appropriate to consider making the Biotechnology degree a transfer degree rather than a career program. | In progress  Completed  No longer applicable | Five year review in spring of 2013, so work has just begun on recommendations |

**Section III: Assessment of General Education & Degree Program Outcomes**

The Program Outcomes for the degrees are listed below. **All program outcomes must be assessed at least once during the 5 year Program Review cycle, and assessment of program outcomes must occur each year**.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **General Education Outcomes** | To which degree(s) is this program outcome related? | Year assessed or to be assessed. | Assessment Methods  Used | What were the assessment results?  (Please provide brief summary data) |
| Critical Thinking/Problem Solving | | All programs | **2012-2013** | Assessments are given in the form of exams. Besides basic knowledge questions, all full time and part time faculty include a variety of questions involving problem solving and critical thinking on such exams | Success rates indicate students succeed in class at a rate of 60 % or higher. See attached data provided by school |
| Values/Citizenship/Community | | All programs | **2013-2014** |  |  |
| Computer Literacy | | All programs | **2014-2015** |  |  |
| Information Literacy | | All programs | **2015-2016** |  |  |
| Oral Communication | | All programs | **2016-2017** |  |  |
| Written Communication | | All programs | **2016-2017** |  |  |
|  | |  |  |  |  |
| **Program Outcomes** | | To which course(s) is this program outcome related? | Year assessed or to be assessed. | Assessment Methods  Used | What were the assessment results?  (Please provide brief summary data) |
| Communicate effectively in a variety of ways with varied audiences through: writing skills, oral communication skills, listening skills, reading skills, and computer literacy. | | BIO-1171 BIO-1272 COM-2206 COM-2211 COM-2225 ENG-1101 ENG-1201 | 2012-13 | The biology department offers a wide assortment of assessment methods concerning communication. These include, but not limited to, group discussions, essay questions, group project presentations, online discussion forums and 10 plus page reports and lab notebooks. | Brief assessment results are not the overall success rates, as students have a trend to do well in this particular assessment but overall success rates are lower than the following data.  For Biology 1171 and 1272, roughly 95% of the students who complete the 10 plus page genetics lab earn a C or higher.  For Biology 1171 and 1272, roughly 95% of the students earn a C or higher on written lab reports.  For our BTN students, assessment in communication is roughly 45% of the overall grade. Roughly 80% of those who complete the written and oral areas of the class receive a C or better on the assignment (s).  For Microbiology, a portion of the overall grade requires group reports and presentations. Roughly 97% of those who complete this work receive a C or better on the assignment.  For Physiology, the writing assignment includes a guide "Writing Biomedical Research Papers" and the class average on the assignment was 95 %  For our various A&P classes, discussion forums and group presentations alloted for a small portion of the overall grade, but those who successfully completed such assignments earned a C or better on the assignment. |
| Demonstrate a strong foundation in the natural sciences and the reasoning skills needed for successfully executing laboratory protocols. | | BIO-1171 BIO-1272 CHE-1211 CHE-1221 | 2013-14 | Assessments are given in the form of exams. Besides basic knowledge questions, all full time and part time faculty include a variety of questions involving problem solving and critical thinking on such exams | N/A |
| Demonstrate the ability to think logically and demonstrate problem solving using analysis, synthesis and evaluation. | | BIO-1171 BIO-1272 CHE-1211 CHE-1221 CHE-2111 CHE-2121 MAT-2270 MET-1131 | 2014-15 | Assessments are given in the form of exams. Besides basic knowledge questions, all full time and part time faculty include a variety of questions involving problem solving and critical thinking on such exams | N/A |
| Demonstrate knowledge of various experimental systems, including bacterial cultures, mammalian cell cultures and recombinant DNA technology. | | BTN-1130 BTN-1140 BTN-1201 | 2015-16 | This outcome is specifically addressed in our biotechnology, microbiology and majors biology courses. Students are assigned and “unknown” bacteria. They are then required to culture the cells and design a series of experiments to determine the strain of bacteria. In all three courses (biotechnology, microbiology and biology majors), students perform a pGLO experiment in which recombinant DNA technology is used to transfer a bioluminescence gene of a jellyfish into a bacterial culture. Students are then required to develop a formal laboratory report detailing the steps and conclusions of the experiment. |  |
| Recognize and articulate an understanding of the increasing interdependence of world cultures and their consequences. | |  | 2016-17 | This program outcome is addressed in our general biology and majors biology courses under the broad spectrum of evolution and population genetics. Students are taught how gene flow and increasing technology and mass transit have led to the gradual homogenization of once distinct human subpopulations. This concept can then be applied to the overarching theme of interdependence of world cultures in respect to genetics. Students in majors biology are required to complete a population genetics experiment as part of their normal course grade. |  |

**General Education Outcomes**

1. Are changes planned as a result of the assessment of general education outcomes? If so, what are those changes?

At this time there is not a need to change the assessment of gen ed outcomes concerning critical thinking, as biology incoroprates critical thinking and problem solving

1. How will you determine whether those changes had an impact?

NA

**Program Outcomes**

1. Are changes planned as a result of the assessment of program outcomes? If so, what are those changes?

The department will incorporate a variety of "assigned points" communication assessments within each class, not just selected few within the department. These are currently being developed by Gretchen Baumle and Marita Abram.

1. How will you determine whether those changes had an impact?

The department will then collect data and analyze the particular results and deduce success in the areas of communication.

**Improvement Efforts**

1. What were the results of changes that were planned in the last Annual Update? Are further changes needed based on these results?

The department chair has assigned two FT tenure track faculty to begin the process of incorporating the general ed outcomes and the program outcomes into our courses offered within the department. This objective is a direct result from feedback received from the five year review conducted last spring.

1. Are there any other improvement efforts that have not been discussed in this Annual Update submission?

The department chair has assigned two faculty members the task of ensuring that both the general education and program outcomes are being met within the department.

**APPENDIX – PROGRAM COMPLETION AND SUCCESS RATE DATA**

**Degree and Certificate Completion**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Division | Department | Department Name | Program | FY 07-08 | FY 08-09 | FY 09-10 | FY 10-11 | FY 11-12 | FY 12-13 |
| SME | 0322 | Biology | BIOE.AS | 4 | . | 4 | 4 | 2 | 3 |
| SME | 0322 | Biology | BIOE.S.AS | . | . | . | . | . | 1 |
| SME | 0322 | Biology | BTN.AAS | 9 | 13 | 3 | 13 | 11 | 13 |
| SME | 0322 | Biology | BTN.S.AAS | . | . | . | . | . | 4 |

**Course Success Rates**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Department** | **Department Name** | **Course** | **FY 07-08** | **FY 08-09** | **FY 09-10** | **FY 10-11** | **FY 11-12** | **FY 12-13** |
| 0322 | Biology | BIO-101 | 53.4% | 59.6% | 42.2% | 56.2% | 64.1% | 75.0% |
| 0322 | Biology | BIO-104 | 70.7% | 69.5% | 67.0% | 61.9% | 72.4% | 57.1% |
| 0322 | Biology | BIO-107 | 58.8% | 58.7% | 59.0% | 58.7% | 61.8% | 78.8% |
| 0322 | Biology | BIO-108 | . | . | . | . | . | . |
| 0322 | Biology | BIO-1101 | . | . | . | . | . | 53.4% |
| 0322 | Biology | BIO-1104 | . | . | . | . | . | 50.8% |
| 0322 | Biology | BIO-1107 | . | . | . | . | . | 60.3% |
| 0322 | Biology | BIO-1108 | . | . | . | . | . | . |
| 0322 | Biology | BIO-111 | 54.2% | 59.4% | 58.9% | 51.8% | 63.3% | . |
| 0322 | Biology | BIO-1111 | . | . | . | . | . | 63.5% |
| 0322 | Biology | BIO-1117 | . | . | . | . | . | . |
| 0322 | Biology | BIO-112 | 64.8% | 82.3% | 78.1% | 73.4% | 82.9% | . |
| 0322 | Biology | BIO-1121 | . | . | . | . | . | 45.3% |
| 0322 | Biology | BIO-113 | 75.1% | 76.8% | 81.3% | 85.0% | 85.3% | 75.0% |
| 0322 | Biology | BIO-1141 | . | . | . | . | . | 48.3% |
| 0322 | Biology | BIO-1147 | . | . | . | . | . | . |
| 0322 | Biology | BIO-117 | . | . | . | . | . | . |
| 0322 | Biology | BIO-1171 | . | . | . | . | . | 56.7% |
| 0322 | Biology | BIO-118 | . | . | . | . | . | . |
| 0322 | Biology | BIO-119 | . | . | . | . | . | . |
| 0322 | Biology | BIO-121 | 52.4% | 58.2% | 48.2% | 52.8% | 47.2% | 57.0% |
| 0322 | Biology | BIO-1211 | . | . | . | . | . | 77.5% |
| 0322 | Biology | BIO-1217 | . | . | . | . | . | . |
| 0322 | Biology | BIO-122 | 65.9% | 71.5% | 75.5% | 69.7% | 69.5% | 83.1% |
| 0322 | Biology | BIO-1222 | . | . | . | . | . | 74.0% |
| 0322 | Biology | BIO-1242 | . | . | . | . | . | 76.7% |
| 0322 | Biology | BIO-1248 | . | . | . | . | . | . |
| 0322 | Biology | BIO-125 | 63.3% | 80.4% | 71.4% | 78.0% | 72.5% | . |
| 0322 | Biology | BIO-127 | . | . | . | . | . | . |
| 0322 | Biology | BIO-1272 | . | . | . | . | . | 76.7% |
| 0322 | Biology | BIO-128 | . | . | . | . | . | . |
| 0322 | Biology | BIO-132 | 48.7% | . | . | . | . | . |
| 0322 | Biology | BIO-138 | . | . | . | . | . | . |
| 0322 | Biology | BIO-141 | 50.9% | 58.0% | 62.9% | 62.7% | 67.9% | . |
| 0322 | Biology | BIO-142 | 66.2% | 65.7% | 68.4% | 69.1% | 74.6% | 100.0% |
| 0322 | Biology | BIO-143 | 77.4% | 80.9% | 80.6% | 77.3% | 76.4% | 84.1% |
| 0322 | Biology | BIO-147 | . | . | . | . | . | . |
| 0322 | Biology | BIO-148 | . | . | . | . | . | . |
| 0322 | Biology | BIO-149 | . | . | . | . | . | . |
| 0322 | Biology | BIO-162 | 76.9% | . | . | . | . | . |
| 0322 | Biology | BIO-167 | . | . | . | . | . | . |
| 0322 | Biology | BIO-171 | 61.6% | 56.0% | 60.7% | 73.6% | 60.9% | . |
| 0322 | Biology | BIO-172 | 83.3% | 96.1% | 78.7% | 90.0% | 91.7% | . |
| 0322 | Biology | BIO-173 | 79.5% | 84.6% | 63.0% | 89.3% | 79.6% | 100.0% |
| 0322 | Biology | BIO-177 | . | . | . | . | . | . |
| 0322 | Biology | BIO-178 | . | . | . | . | . | . |
| 0322 | Biology | BIO-179 | . | . | . | . | . | . |
| 0322 | Biology | BIO-205 | 87.2% | 88.2% | 87.8% | 82.4% | 82.5% | 80.4% |
| 0322 | Biology | BIO-206 | . | . | . | . | . | . |
| 0322 | Biology | BIO-211 | 75.0% | 70.0% | 64.1% | 65.1% | 75.2% | 75.0% |
| 0322 | Biology | BIO-212 | . | . | . | . | . | . |
| 0322 | Biology | BIO-2205 | . | . | . | . | . | 78.1% |
| 0322 | Biology | BIO-2206 | . | . | . | . | . | . |
| 0322 | Biology | BIO-2211 | . | . | . | . | . | 49.2% |
| 0322 | Biology | BIO-2212 | . | . | . | . | . | . |
| 0322 | Biology | BIO-222 | 93.3% | 91.7% | 85.7% | 69.2% | 73.7% | . |
| 0322 | Biology | BIO-2225 | . | . | . | . | . | 88.9% |
| 0322 | Biology | BIO-225 | 75.0% | 55.6% | . | 71.4% | 83.3% | . |
| 0322 | Biology | BIO-226 | . | . | . | . | . | . |
| 0322 | Biology | BIO-235 | . | . | . | . | 100.0% | . |
| 0322 | Biology | BIO-297 | . | . | . | . | . | . |
| 0322 | Biology | BTN-110 | 63.6% | 66.7% | 87.0% | 76.9% | 80.0% | . |
| 0322 | Biology | BTN-1110 | . | . | . | . | . | 71.4% |
| 0322 | Biology | BTN-1120 | . | . | . | . | . | 79.2% |
| 0322 | Biology | BTN-1130 | . | . | . | . | . | 81.8% |
| 0322 | Biology | BTN-1131 | . | . | . | . | . | . |
| 0322 | Biology | BTN-115 | 81.8% | . | . | . | . | . |
| 0322 | Biology | BTN-120 | 78.6% | 87.5% | 86.4% | 85.7% | 82.4% | . |
| 0322 | Biology | BTN-1201 | . | . | . | . | . | 84.0% |
| 0322 | Biology | BTN-130 | 38.5% | 71.4% | 59.3% | 88.0% | 78.3% | . |
| 0322 | Biology | BTN-131 | . | . | . | . | . | . |
| 0322 | Biology | BTN-140 | 71.4% | 60.0% | 79.2% | 80.0% | 83.3% | . |
| 0322 | Biology | BTN-201 | . | 100.0% | 90.9% | 89.5% | 92.9% | . |
| 0322 | Biology | BTN-210 | 86.7% | 100.0% | 100.0% | 87.5% | 88.2% | . |
| 0322 | Biology | BTN-220 | 100.0% | 88.9% | 100.0% | 90.9% | 91.7% | . |
| 0322 | Biology | BTN-2210 | . | . | . | . | . | 64.7% |
| 0322 | Biology | BTN-2211 | . | . | . | . | . | . |
| 0322 | Biology | BTN-2220 | . | . | . | . | . | 100.0% |
| 0322 | Biology | BTN-2230 | . | . | . | . | . | 71.4% |
| 0322 | Biology | BTN-230 | 86.7% | 88.9% | 57.1% | 92.3% | 77.8% | . |
| 0322 | Biology | BTN-231 | . | . | . | . | . | . |
| 0322 | Biology | BTN-235 | 100.0% | 57.1% | 100.0% | 100.0% | 88.2% | . |
| 0322 | Biology | BTN-240 | 100.0% | 100.0% | 100.0% | 92.3% | 100.0% | . |
| 0322 | Biology | BTN-270 | . | . | 100.0% | . | . | . |
| 0322 | Biology | BTN-295 | 93.8% | . | . | . | . | . |