

1.0: PROGRAM DATA AND RESOURCE REPOSITORY

1.2: QUANTITATIVE AND QUALITATIVE DATA

All programs are provided with the most recent three years of data by the Office of Institutional Effectiveness, Planning, and Research (IR) as well as three-year budget data provided by the Financial Service Office. The budget data will typically be available in mid-September after final reconciliation of the previous fiscal year.

There is no user entry required for this section unless the program faculty wish to include other data pertinent to program review, planning and development. Programs should spend some time reflecting and discussing the data elements prior to proceeding with the completion of the remaining sections. Program faculty are encouraged to include other data as desired. (*See Resource A for data set specifics and suggestions for further data collection/evaluation.*)

Narrative:

**Annual Biology Program Review
Summer 2016 – Spring 2017**

Number of Faculty

Full time Part time Total
2 5 7

Student Credit Hours by Faculty Type

Full time Part time Total
1357 377 1734

Enrollment by Faculty Type

Full time Part time Total
277 79 356

Faculty Name by Type

Full time

Archana Lal
Brian Foreman

Part time

Dale Reynolds
Mallory Byrd
Rachel Martin
Cynthia Kiser
James Weilert

Average Class Size, Completion, and Attrition

Ave. Class Size Completers Attrition
15 325 (91.5%) 31 (8.5%)

Course Completion, Success and Attrition by Distance Learning vs. Face to Face

Completers Distance Completers F to F
52 (81%) 273 (93%)

Success Distance Success F to F
41 (79%) 253 (93%)

Attrition Distance Attrition F to F
11 (17%) 20 (7%)

Number of Degrees Awarded

0

Number of Graduates Transferring

0

Class Capacities & Percent Fill Rate:

71.48%

Every biology class offered on campus is capped at 20 students to provide adequate lab space to each student.

Balance of Program curriculum and impact across the college by indicating courses offered primarily to:

1. Meet general education requirements

In the academic year 2016-2017, a total of 24 sections of different biology courses were offered. Out of these 24 sections, 12 sections were General Biology (50%) to support general education requirements.

2. Facilitate transfer

Biology I, Biology II, Anatomy & Physiology, and Nutrition courses that are offered in the biology program meet or exceed the learning outcomes and competencies specified by the Kansas core outcomes groups' project as approved by the Kansas Board of Regents. Prehistoric Life course is offered at ICC and Pittsburg State University and is transferred as an elective course in other regent's universities. The course outcomes in Microbiology are aligned with the recommended outcomes by American Society for Microbiology and is transferred as an introductory microbiology course or an elective in regent's universities.

3. Support career & technical programs:

Biology I is a required pre-requisite course in Veterinary Technology program and hence, all the students who wish to go into Veterinary technology program complete Biology I. Several students enroll and complete Microbiology and Anatomy & Physiology courses to enter into nursing and dental hygienist programs.

4. Faculty Summaries or reports from conference attendance:

A full time faculty member, Archana Lal, attended American Society for Microbiology Conference for Undergraduate Educators at Bethesda, Maryland during July. This conference is for educators who primarily teach to undergraduate students and is attended by about 300 educators from all over the world. Attendees share the innovative teaching techniques and the latest developments in the area of microbiology education. During the conference Archana facilitated a Microbrew session and also presented her work "Using a 3-D Printer to Learn Cell Structure" in a Microbrew session. During Spring 2016, Archana was also selected for the Biology Scholars Program Writing and Publishing Course: From Science Education Research to Publication, sponsored by the American Society for Microbiology. During Spring and Summer 2016, she participated in the program online and in July, immediately before the conference, she participated in the 3 day long intensive training and discussions. Archana also judged a science fair at the local high school (St. Andrews Catholic School) during Spring 2017.

The other full time faculty member, Brian Foreman, is a member of the Kansas Academy of Sciences. He attended the Kansas Academy of Science (KAS) meetings in McPherson last spring and at Pittsburg State University the previous spring (where he judged several student talks). In addition to this, he continues to attend area schools each year at the invitation of local teachers to speak on various science related topics. Recent meetings include meetings with teachers at Eisenhower and Riley Elementary schools. Last spring he also sponsored a field trip taking students to visit the Sternberg Museum in Ft. Hays, Kansas, providing information and background about the exhibits.

3.0: ASSESSMENT OF STUDENT LEARNING OUTCOMES

3.2: SIGNIFICANT ASSESSMENT FINDINGS

In this section the program should provide a narrative overview of the program's significant student learning outcomes assessment findings, any associated impact on curriculum, as well as any ongoing assessment plans. The program may attach data charts, assessment reports or other relevant materials. (See *Appendix 2 for ICC SLO's and Resource C- for more information.*)

Narrative:

For number of years both full time faculty members have been involved in student learning outcomes assessment in all the courses they teach. In the past, it has been difficult to get the data from adjunct faculty. There have been the following significant trends in the student learning outcomes assessment:

1. Each semester at least one student learning outcome from each course was assessed. The goal was set at 70% (students will achieve at least 70% proficiency in the learning outcome). In all the courses offered the outcome was met with 70% or more proficiency. Please refer to the attached documents for all the five biology courses offered.
2. General biology was offered in face to face, hybrid, and online formats. Though attrition was slightly higher in online sections but students who completed the course met the learning outcome.
3. The main reason for higher attrition and failure rates in online and hybrid format was lack of student participation. Despite email reminders and announcement posted in Canvas, few students stopped participating and failed to submit all the required work by the weekly deadlines.

Evidence:

- [Biology I 2016-2017](#)
- [General Biology 2016-2017](#)
- [A & P 2016-2017](#)
- [Nutrition 2016-2017](#)
- [Microbiology 2016-2017](#)

Planning 025: Comprehensive Report on Course Level Outcome Assessment

| | |
|---------------------------|---|
| Outcome | 3. The student will be able to identify Cellular Characteristics; A. Cell Structure and Function; B. Membrane Structure, Function, and Transport. |
| Related Outcome | AS Biology > 2. The student will be able to differentiate cellular structures and their functions and integrate structural hierarchy. Independence Community College > Quantitative & Scientific Reasoning: The student will be able to use processes, procedures, data, or evidence to solve problems. AS Biology > 1. The student will be able to describe biological terms to comprehend biological systems. |
| Measure 1: | Five Test Questions |
| Measure 1 Type: | Direct |
| Measure 1 Results: | Q 1: Out of 22 students, 18 answered the question correctly.....82% Q 2: Out of 22 students, 14 answered the question correctly.....64% Q 3: Out of 22 students, 18 answered the question correctly.....82% Q 4: Out of 21 students, 18 answered the question correctly.....86% Q 5: Out of 21 students, 18 answered the question correctly.....86% |
| Measure 2: | Two Labs |
| Measure 2 Type: | Direct |
| Measure 2 Results: | Lab 1: All the 22 students completed the lab satisfactorily.....100% Lab 2: All the 22 students completed the lab satisfactorily.....100% |
| Measure 3: | Two Lab Quiz questions: one from each Lab quiz |
| Measure 3 Type: | Direct |
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| Measure 3 Results: | Q 1: Out of the total possible 33 points, students received 29.5.....89% Q 2: Out of the total possible 22 points, students received 17.....77% |
| This outcome was: | Met |
| Findings | |
| *If less than Met, course should plan further action to improve performance. | Further Action Unnecessary |
| What strengths were displayed through the assessments of your measures? | Students showed a clear understanding of cellular structure, membrane structure and transport through the plasma membrane. |
| What weaknesses were displayed through the assessments of your measures? | |
| Additional Comments: | |
| 1. | Outcome was met. No further action is necessary. |
| 2. | |
| 3. | |
| Upload any supporting documents to further elaborate on the recommendations listed above. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Assessment Changes | |
| Restructure Outcome Statement | |
| Revise Measurement Approach | |
| Collect and Analyze Additional Data and Information | |
| Change Methods of Data Collection | |
| Other | |
| Describe Changes | |
| Programmatic Changes | |
| Revamp Services | |

| | |
|---|--|
| Make Technology Related Improvements | |
| Make Personnel Related Changes | |
| Implement Additional Training | |
| Add New Service(s) or Program(s) | |
| Delete Service(s) or Program(s) | |
| Other | |
| Describe Changes | |

Planning 025: Comprehensive Report on Course Level Outcome Assessment

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|---------------------------|---|
| | ASSESSMENT PERIOD: AY 2016 |
| Outcome | 3. The student will be able to describe the principles of Bioenergetics. Enzymes Activity Metabolism Cellular Respiration / Photosynthesis |
| Related Outcome | AS Biology > 1. The student will be able to describe biological terms to comprehend biological systems. AS Biology > 2. The student will be able to differentiate cellular structures and their functions and integrate structural hierarchy. |
| Measure 1: | Test Questions |
| Measure 1 Type: | Direct |
| Measure 1 Results: | Fall 2016 (Online class) Question 1: 80% of the students answered correctly Question 2: 89% of the students answered correctly Question 3: 90% of the students answered correctly Question 4: 100% of the students answered correctly Question 5: 78% of the students answered correctly Question 6: 100% of the students answered correctly Question 7: 80% of the students answered correctly Question 8: 90% of the students answered correctly Question 9: 90% of the students answered correctly Question 10: 90% of the students answered correctly Overall % correct for the test questions was 89% Fall 2016; two sections of traditional |

grounded General Biology. Results below are from both sections combined (n=39)

Question 1: 70% of the students answered correctly

Question 2: 76% of the students answered correctly

Question 3: 71% of the students answered correctly

Question 4: 77% of the students answered correctly

Question 5: 70% of the students answered correctly

Question 6: 70% of the students answered correctly

Question 7: 85% of the students answered correctly

Question 8: 70% of the students answered correctly

Question 9: 72% of the students answered correctly

Question 10: 87% of the students answered correctly

Overall % correct for the test questions was 75%

Summer 2016: During summer 2016 two sections of General Biology were offered one online and one on-grounds. The results provided here are from both the sections combined.

Question 1: 80% of the students answered correctly.

Question 2: 95% of the students answered correctly.

Question 3: 85% of the students answered correctly.

Question 4: 84% of the students answered correctly.

Question 5: 74% of the students answered correctly.

Question 6: All the students answered correctly.

Question 7: All the students answered correctly.
Question 8: 89% of the students answered correctly.
Question 9: 89% of the students answered correctly.
Question 10: All the students answered correctly.

Overall result for the ten test questions: 89%.

Spring 2017 (Combined section, B. Foreman)

Question 1: 70% of students answered correctly
Question 2: 71% of students answered correctly
Question 3: 72% of students answered correctly
Question 4: 71% of students answered correctly
Question 5: 70% of students answered correctly
Question 6: 70% of students answered correctly
Question 7: 78% of students answered correctly
Question 8: 71% of students answered correctly
Question 9: 74% of students answered correctly
Question 10: 74% of students answered correctly

Spring 2017 (ON Grounds section, A. Lal)

Question 1: 53% of students answered correctly
Question 2: 77% of students answered correctly
Question 3: 88% of students answered correctly
Question 4: 90% of students answered correctly

Question 5: 90% of students answered correctly
Question 6: 70% of students answered correctly
Question 7: 80% of students answered correctly
Question 8: 90% of students answered correctly
Question 9: 90% of students answered correctly
Question 10: 50% of students answered correctly

Overall result for the ten test questions: 77%.

Spring 2017 (Hybrid section, A. Lal)

Question 1: 30% of students answered correctly
Question 2: 60% of students answered correctly
Question 3: 55% of students answered correctly
Question 4: 88% of students answered correctly
Question 5: 81% of students answered correctly
Question 6: 69% of students answered correctly
Question 7: 50% of students answered correctly
Question 8: 56% of students answered correctly
Question 9: 69% of students answered correctly
Question 10: 38% of students answered correctly

Overall result for the ten test questions: 59%.

Spring 2017 (Two online sections combined, A. Lal)

Question 1: 96% of students answered

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| | <p>correctly</p> <p>Question 2: 100% of students answered correctly</p> <p>Question 3: 96% of students answered correctly</p> <p>Question 4: 100% of students answered correctly</p> <p>Question 5: 91% of students answered correctly</p> <p>Question 6: 100% of students answered correctly</p> <p>Question 7: 67% of students answered correctly</p> <p>Question 8: 96% of students answered correctly</p> <p>Question 9: 83% of students answered correctly</p> <p>Question 10: 100% of students answered correctly</p> <p>Overall result for the ten test questions: 93%.</p> |
| Measure 2: | Labs |
| Measure 2 Type: | Direct |
| Measure 2 Results: | <p>Fall 2016 (Online section)</p> <p>Cellular Respiration Lab: Overall result: 100%</p> <p>Photosynthesis Lab: Overall Result: 83%</p> <p>Fall 2016 (on ground sections)</p> <p>Cellular Respiration Lab: Overall result: 100%</p> <p>Photosynthesis Lab: Overall result: 100%</p> <p>Summer 2016</p> |

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|---------------------------|---|
| | <p>Cellular Respiration Lab: Overall result: 95%</p> <p>Photosynthesis Lab: Overall Result: 96%</p> <p>Spring 2017 (B. Foreman) Cellular Respiration Lab 100% Photosynthesis Lab 100%</p> <p>Spring 2017, On grounds section, A. Lal Cellular Respiration Lab: 100% Photosynthesis Lab: 98%</p> <p>Spring 2017, Hybrid section, A. Lal Cellular Respiration Lab: 95% Photosynthesis Lab: 85%</p> <p>Spring 2017, Two Online sections combined, A. Lal Cellular Respiration Lab: 88% Photosynthesis Lab: 79%</p> |
| Measure 3: | |
| Measure 3 Type: | |
| Measure 3 Results: | |
| This outcome was: | Met |
| Findings | <p>Summer 2016: General Biology course was offered for the first time online at ICC. Though the results presented above are combined from both the sections but individual results show that students in online class were learning the material as effectively as their counterparts in traditional on grounds class.</p> <p>Fall 2016: Data shows that students met the outcome in both the online as well as on ground sections.</p> <p>Spring 2017 (A. Lal) Data shows that students in the on grounds</p> |

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| | <p>and online sections met the outcome in both the exam and lab parts. However, students in the hybrid class did not do well in the exam part but did well in the lab part.</p> <p>Overall combined results in both the lecture and lab part show that the outcome was met as students scored 92 % in on-grounds class, 80% in the hybrid class, and 87% in the two online classes combined.</p> |
| *If less than Met, course should plan further action to improve performance. | Further Action Unnecessary |
| What strengths were displayed through the assessments of your measures? | Online class works well for the those students who are motivated and complete their work. Late Nite Labs were adapted for the online section for the laboratory part of the course. Analysis of the results show that it is a good tool to have labs online and students are learning the material in an online setting. |
| What weaknesses were displayed through the assessments of your measures? | |
| Additional Comments: | |
| 1. | None at this time. |
| 2. | |
| 3. | |
| Upload any supporting documents to further elaborate on the recommendations listed above. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Assessment Changes | |
| Restructure Outcome Statement | |
| Revise Measurement Approach | |
| Collect and Analyze Additional Data and Information | |
| | |

| | |
|---|--|
| Change Methods of Data Collection | |
| Other | |
| Describe Changes | |
| Programmatic Changes | |
| Revamp Services | |
| Make Technology Related Improvements | |
| Make Personnel Related Changes | |
| Implement Additional Training | |
| Add New Service(s) or Program(s) | |
| Delete Service(s) or Program(s) | |
| Other | |
| Describe Changes | |

Planning 025: Comprehensive Report on Course Level Outcome Assessment

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|---------------------------|--|
| Outcome | 3. The student will be able to identify and describe systems that integrate, regulate, and control the activities of the body, including the nervous system, special senses, and the endocrine system. |
| Related Outcome | Independence Community College > Quantitative & Scientific Reasoning: The student will be able to use processes, procedures, data, or evidence to solve problems. |
| Measure 1: | Test questions |
| Measure 1 Type: | Direct |
| Measure 1 Results: | <p>Fall 2016. 14 students completed all assessment items.</p> <p>Question 1: 86% of students answered correctly</p> <p>Question 2: 86% of students answered correctly</p> <p>Question 3: 93% of students answered correctly</p> <p>Question 4: 86% of students answered correctly</p> <p>Question 5: 71% of students answered correctly</p> <p>Question 6: 86% of students answered correctly</p> <p>Question 7: 79% of students answered correctly</p> <p>Question 8: 93% of students answered correctly</p> <p>Question 9: 93% of students answered correctly</p> <p>Question 10: 86 % of students answered correctly</p> <p>Spring 2017</p> <p>Question 1: 74% of the students answered correctly</p> <p>Question 2: 79% of the students answered correctly</p> <p>Question 3: 74% of the students answered</p> |

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| | <p>correctly</p> <p>Question 4: 79% of the students answered correctly</p> <p>Question 5: 74% of the students answered correctly</p> <p>Question 6: 84% of the students answered correctly</p> <p>Question 7: 89% of the students answered correctly</p> <p>Question 8: 79% of the students answered correctly</p> <p>Question 9: 84% of the students answered correctly</p> <p>Question 10: 79% of the students answered correctly</p> |
| Measure 2: | <p>Fall 2016</p> <p>Lab exam: 71% of students passed with 70% or higher (100%)</p> <p>Spring 2017</p> <p>Lab Exam: class average 70%</p> |
| Measure 2 Type: | |
| Measure 2 Results: | |
| Measure 3: | |
| Measure 3 Type: | |
| Measure 3 Results: | |
| This outcome was: | Met |
| Findings | |
| *If less than Met, course should plan further action to improve performance. | Further Action Unnecessary |
| What strengths were displayed through the assessments of your measures? | |
| What weaknesses were displayed through the assessments of your measures? | <p>Students seemed to perform less well on practicum than on theory.</p> <p>Spring semester I gave them additional time to prepare for lab exam.</p> |
| Additional Comments: | |
| 1. | Direct more effort at improving practical knowledge by enriching the laboratory |

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| | experience with more time in lab. |
| 2. | |
| 3. | |
| Upload any supporting documents to further elaborate on the recommendations listed above. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Assessment Changes | |
| Restructure Outcome Statement | |
| Revise Measurement Approach | |
| Collect and Analyze Additional Data and Information | |
| Change Methods of Data Collection | |
| Other | |
| Describe Changes | |
| Programmatic Changes | |
| Revamp Services | |
| Make Technology Related Improvements | |
| Make Personnel Related Changes | |
| Implement Additional Training | |
| Add New Service(s) or Program(s) | |
| Delete Service(s) or Program(s) | |
| Other | |
| Describe Changes | |

Planning 025: Comprehensive Report on Course Level Outcome Assessment

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| Outcome | FALL Online 4. The student will be able to analyze the role of nutrition in fitness and sports, eating disorders and their risk factors, and under-nutrition. SPRING Online 4. The student will be able to explain energy balance and weight control as it relates to nutrition and wellness. |
| Related Outcome | |
| Measure 1: | Final exam: 4 Question |
| Measure 1 Type: | Direct |
| Measure 1 Results: | Q 1: Students received 16 out of 20 points. 80% Q 2: Students received 15 out of 20 points. 75% Q 3: Students received 5 out of 6 points. 83% Q 4: Students received 13 out of 14 points. 81% Overall average in four test questions: 79% |
| Measure 2: | Chapter 7 Discussion forum |
| Measure 2 Type: | Direct |
| Measure 2 Results: | Overall students received 57 out of 75 points...76% |
| Measure 3: | |
| Measure 3 Type: | |
| Measure 3 Results: | |
| This outcome was: | Met |
| Findings | A few students did not complete both parts of the discussion forum. |
| *If less than Met, course should plan further action to improve performance. | Further Action Unnecessary |
| What strengths were displayed through the assessments of your measures? | Students understood the concepts of energy balance. In the final exam questions they were able to explain the concept of energy balance very well with some good |

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| | examples. |
| What weaknesses were displayed through the assessments of your measures? | |
| Additional Comments: | |
| 1. | |
| 2. | |
| 3. | |
| Upload any supporting documents to further elaborate on the recommendations listed above. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Assessment Changes | |
| Restructure Outcome Statement | |
| Revise Measurement Approach | |
| Collect and Analyze Additional Data and Information | |
| Change Methods of Data Collection | |
| Other | |
| Describe Changes | |
| Programmatic Changes | |
| Revamp Services | |
| Make Technology Related Improvements | |
| Make Personnel Related Changes | |
| Implement Additional Training | |
| Add New Service(s) or Program(s) | |
| Delete Service(s) or Program(s) | |
| Other | |
| Describe Changes | |

Planning 025: Comprehensive Report on Course Level Outcome Assessment

| | |
|---------------------------|---|
| Outcome | <p>2. Microbial genetics</p> <p>Upon completion of this section, the student will be able to demonstrate measurable understanding of microbial genetics, including the following topics.</p> <p>Inheritance of genetic information</p> <p>Cause, consequences and uses of mutations</p> <p>Exchange and acquisition of genetic information</p> <p>Regulation of gene expression</p> |
| Related Outcome | <p>AS Biology > 3. The student will be able to relate the theory of evolution to the laws of inheritance.</p> <p>Independence Community College > Quantitative & Scientific Reasoning: The student will be able to use processes, procedures, data, or evidence to solve problems.</p> <p>AS Biology > 1. The student will be able to describe biological terms to comprehend biological systems.</p> |
| Measure 1: | Test questions in chapter test and final exam |
| Measure 1 Type: | Direct |
| Measure 1 Results: | <p>Question 1: 12 out of 15 students answered it correctly.</p> <p>Question 2: 6 out of 15 students answered it correctly.</p> <p>Question 3: 14 out of 15 students answered it correctly in the final exam.</p> <p>Question 4: 8 out of 15 students answered it correctly.</p> <p>Question 5: 6 out of 15 students answered it correctly.</p> <p>Question 6: All the students answered it correctly in the final exam.</p> <p>Question 7: All the students answered it correctly in the final exam.</p> <p>Question 8: 8 out of 15 students answered it correctly.</p> |

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| | Overall students achieved 70% in these test questions. |
| Measure 2: | Class Assignment |
| Measure 2 Type: | Direct |
| Measure 2 Results: | Overall students achieved 85% in this assignment. |
| Measure 3: | |
| Measure 3 Type: | Direct |
| Measure 3 Results: | |
| This outcome was: | Met |
| Findings | Overall students achieved 78% in this outcome. |
| *If less than Met, course should plan further action to improve performance. | Further Action Unnecessary |
| What strengths were displayed through the assessments of your measures? | |
| What weaknesses were displayed through the assessments of your measures? | |
| Additional Comments: | |
| 1. | No recommendation is required at this time. |
| 2. | |
| 3. | |
| Upload any supporting documents to further elaborate on the recommendations listed above. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Upload additional documents. | |
| Assessment Changes | |
| Restructure Outcome Statement | |
| Revise Measurement Approach | |
| Collect and Analyze Additional Data and Information | |
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|---|--|
| Change Methods of Data Collection | |
| Other | |
| Describe Changes | |
| Programmatic Changes | |
| Revamp Services | |
| Make Technology Related Improvements | |
| Make Personnel Related Changes | |
| Implement Additional Training | |
| Add New Service(s) or Program(s) | |
| Delete Service(s) or Program(s) | |
| Other | |
| Describe Changes | |

4.0: EXTERNAL CONSTITUENCIES AND SIGNIFICANT TRENDS

An important component of maintaining a superior program lies in awareness and understanding of other possible factors that may impact the program and/or student outcomes. After consideration of these other factors, program faculty should document the relevant information within this section. As applicable, this should include the following. (See *Resource B* for more information and other examples of external constituencies that may apply to both career and transfer programs.) Program Advisory Committee, Specialized Accreditation, etc.

4.1: PROGRAM ADVISORY

Create a form in this section to include Advisory Member Name/ Title/ Organization/ Length of Service on committee; note the Committee Chair with an asterisk(*).

Upload meeting minutes from the previous spring and fall semesters.

Narrative:

In the Biology program there is no advisory committee.

4.2: SPECIALIZED ACCREDITATION

- Include Accrediting Agency title, abbreviation, ICC contact; Agency contact, Date of Last Visit, Reaffirmation, Next Visit, FY Projected Accreditation Budget.
- Upload the most recent self-study and site visit documents.
- Upload agency correspondence which confirm accreditation status.

Narrative:

For the Biology program no specialized accreditation is required.

4.3: OTHER

See Resource B for examples of external constituencies that may apply.

Narrative:

Four out of 6 courses offered in the biology program (Biology I, Biology II, Anatomy & Physiology, and Nutrition) meet or exceed the learning outcomes and competencies specified by the Kansas core outcomes groups' project as approved by the Kansas Board of Regents. One course, Prehistoric Life, is offered at ICC and Pittsburg State University and is transferred as an elective course in other regents' universities. The course outcomes in Microbiology are aligned with the recommended outcomes by American Society for Microbiology and is transferred as an introductory microbiology course or an elective in regent's universities.

Transfer program articulations:

The program exposes students to all major areas of contemporary biology including some molecular genetics. General Biology, Biology I, Biology II, Nutrition, and Human Anatomy & Physiology meet KBOR learning outcomes and articulate with the same courses at all other regent's institutions where a corresponding course exists.

| Transfer Equivalencies | | | | | | |
|---|--|----------------------------------|--|--|---|-----------------------------------|
| ICC Biology course | WSU | PSU | ESU | FHSU | KU | K-State |
| BIO 1005 General Biology 5 CH | Bio 106 Human Organism 5CH | Biol 111/112 Gen Bio | GB 100/101 Gen Biol 4CH | BIOL 100/102 Human Biology 4CH | BIOL 100/102 Principles Biology w/lab 5CH | BIOL 198 Prin Biol |
| BIO 1115 Bio I: Prin of Cell & Molec. Biol. 5 CH | Bio 210 General Bio I 5CH | Biol 211 Prin of Biol I | GB 140/141 Prin of Biol 5CH | | BIOL 150 Prin of Mol & Cell Biology 5CH | Biol 198 Prin of Bio |
| BIO 1053 Prehistoric Life 3CH | Biology Elective 3CH | Biol Elective | not evaluated | Biol Elective | No equivalency | Biol Elective? |
| BIO 2003 Environmental Biol 3 CH | Bio 370 Intro. Env. Sci. 3 CH | Biol 113 Env. Life Science | BI 200T2/3 Biol Elective 3CH | BIOL 200 Humans & Environment 3CH | EVRN 148 Sci Prin of Env Studies | Biol 303 Ecol of Env Prob |
| BIO 2055 Microbiology | Bio 220 Intro. Microbiology 5CH | Biol Elective | Biol Elective | BIOL 240 Microbiology for Allied Health | BIOL 200/203 Basic Micro w/lab 5CH | Biol 455 Gen Micro |
| BIO 2045 Human A&P 5CH | Bio 223 Human A&P 5CH | Biol 257 Human A&P | ZO 362/363 Human A&P 5CH | BIOL 230/232/234 Human A&P | Not Listed | Biol ??? |
| Bio 2053 Nutrition 3CH | HS 331 Prin Of Nutrition 3CH | FCS 203 Nutrition & Health | not evaluated | Not evaluated | HSES U Nutrition 3CH | HN 132 Bas Nut |
| Bio 2115 Bio II: Prin of Org. Biol. 5 CH | Biol 211 & 211L Gen Bio II & Gen Bio II Lab | Biol 212 Prin of Biology | Not Offered | Biol 250 (Botany) or Biol 260 (Zoology) | Biol 152 Organismal Biology | Biol 201 Organismic Biology |

7.0: PROGRAM PLANNING AND DEVELOPMENT FOR STUDENT SUCCESS

7.1: NARRATIVE/REFLECTION ON QUALITATIVE AND QUANTITATIVE DATA AND TRENDS

Thoughtful reflection on the available assessment data is key to effective and meaningful action planning. In this section program faculty should provide a narrative reflection on trends observed in the data from section 1.0. (See *Resource C*)

Narrative:

7.1 Narrative/Reflection on Qualitative and Quantitative Data & Trends

Total student credit hours during 2016 - 2017 academic year were 1734 out of which 1357 (78%) were taught by the two full time faculty members while 377 (22%) were taught by the adjuncts. During this academic year the overall completion rate was 91.5%. Completion rate for face to face students was slightly higher as compared to students enrolled in online classes (93% vs. 81%). Overall attrition rate for biology classes was 8.5%. For face to face classes, attrition rate was much lower (7%) while for the online classes it was 17%. This difference in the completion and attrition rates between face to face and online classes may be due to the fact that only General Biology for non-majors class is offered online while none of the Biology major's classes (Biology I, Biology II, Microbiology, Anatomy & Physiology) are offered online. Also, fewer classes were offered online (out of a total 26 classes only 5 were offered online).

Among the completers, student success rate was also higher in face to face classes as compared to online classes (93% vs 79%). Again, one of the factor may be the fact that only non-majors class is offered online while all the majors classes are offered face to face.

During 2016-2017 academic year no Biology degree was offered which is different from previous years. There are several possible explanations for this:

1. No Organic Chemistry was offered during the Fall 2016 and the students who were pursuing Biology program at ICC left after completing their freshman year at ICC.
2. No Biology II (a class required for Biology degree at ICC) was offered during Spring 2017.
3. There are few ongoing issues during the initial advisement of students (fall semester of freshman year). Sometimes, Biology majors are enrolled in General Biology for non-majors during their first semester of freshman year. By the time they realize that they are in the wrong class (towards the end of their fall semester of the freshman year, their entire year's course sequence is affected badly.
4. Lots of the students enroll in our courses to complete the prerequisites to apply to Nursing and Vet Tech programs. Most of the students who enroll in Microbiology and Anatomy & Physiology complete these classes to enter into Nursing or Dental hygienist programs.

Though the next two points are from Fall 2017, they are still included here because they might affect the biology program graduates during the coming academic years.

1. During Fall 2017, Biology I and Chemistry I classes (Both are offered only during the fall semester) were offered at the same time. Students who wanted to pursue Biology majors will have to wait for another year to complete the sequence.
2. During Fall 2017, Anatomy & Physiology was not offered during regular day time hours. Only an evening section was offered.

7.2: ACADEMIC PROGRAM VITALITY REFLECTION, GOALS, AND ACTION PLANS

The program vitality assessment, goals and action planning are documented by completing the Program Summative Assessment form.

Programs should use previous reflection and discussion as a basis for considering program indicators of demand, quality, and resource utilization and a program self-assessment of overall program vitality. (See *Resource D for detailed descriptions of the vitality recommendation categories.*)

Programs will also establish or update 3 to 5 long-term and short-term goals and associated action plans which support student success. These goals should include consideration of honors, co-curricular and faculty development activities. Long-term goals are considered to be those that extend 3 to 5 years out, while short-term goals are those that would be accomplished in the next 1 to 2 years. Additionally, programs should update status on current goals.

Programs should use

S.M.A.R.T. goal setting for this purpose. (See *Resource E on S.M.A.R.T. goal setting; Resource F on Action Plans for Student Success; and Resource C- for more information.*)

Narrative:

7.2 Academic Program Vitality Reflection, Goals and Action Plans

A. Program Indicators of Demand:

According to the Bureau of Labor Statistics (www.bls.gov), there are several types of jobs available in related areas with a bachelor's degree in Biology. Employment of life, physical, and social science occupations is projected to grow 10 percent from 2016 to 2026, faster than the average for all occupations, which will result in about 124,800 new jobs. Increasing demand for expertise in the sciences, particularly in occupations involved in biomedical research, psychology, energy management, and environmental protection, is projected to result in employment growth.

Please refer to the attached file (titled "program indicators of demand") to view the top search results from the Bureau of Labor Statistics for the job for biologists:

B. Quality & Resource Utilization:

The faculty in the Biology program promote student success through proper advisement and developing clear goals and expectations from the students. The faculty try to involve and engage students so that they take interest in their own learning and develop critical thinking skills. Looking at the developing trends in the online course offerings and continued students' interest in online courses, general biology for non-majors was offered online. At least one section (and sometimes two sections, if there was enough demand) of online General Biology was offered each semester to meet student demands and interest. The lead faculty spent a lot of time researching and talking to colleagues at other institutions and attending various sessions and presentations in the American Society for Microbiology for Undergraduate Educators (ASMCUE). The goal was to offer the online course that is comparable to the face to face class in lecture as well the laboratory component. After lots of research a lab platform "LATE NITE LABS" was selected that offers comparable laboratory experience to students enrolled in online section of General Biology.

C. Goal Setting:

Short-term Goals:

- Improve advisement specially during the fall semester of freshman year when the student enters ICC. To achieve this, few changes have been suggested in the Biology program as listed in the catalog (pending approval in the STEMB division and academic council). It is clearly indicated there that if a student wishes to pursue Biology major then he/she should be enrolled in Biology I (for majors) and Chemistry I for majors during his/her first semester at ICC.
- Improved course scheduling at the division level. In the past, courses were offered during the times when students were not able to enroll due to some conflicts or two required courses were offered at the same time. To avoid these type of conflicts, faculty teaching these courses plan to coordinate their course offering times.

Long-term goals:

- Improve scientific reasoning and critical thinking skills among students by discussing more current events in the biological field and assess them during laboratory exercises.
- Increase active learning exercises during the class and/or lab times to further promote student learning.
- Promote Biology major among students by offering courses with no conflicts.
- Continued efforts towards professional development for Biology faculty

D. Overall Program Vitality:

Considering the data and analysis provided in A, B, and C above and the qualitative and quantitative data provided in section 1.2, it is recommended to maintain the current levels of support / continuous improvement for the Biology program.

Recommended Vitality Category: Category 2 – Maintain current levels of support/continuous improvement

Evidence:

- [Program indicators of demand](#)

- 1. Biological Technicians:** Biological technicians help biological and medical scientists conduct laboratory tests and experiments. <https://www.bls.gov/ooh/life-physical-and-social-science/biological-technicians.htm>

| Quick Facts: Biological Technicians | |
|---|---------------------------------------|
| 2016 Median Pay | \$42,520 per year \$20.44 per hour |
| Typical Entry-Level Education | Bachelor's degree |
| Work Experience in a Related Occupation | None |
| On-the-job Training | None |
| Number of Jobs, 2016 | 82,100 |
| Job Outlook, 2016-26 | 10% (Faster than average) |
| Employment Change, 2016-26 | 8,400 |

- 2. Zoologists and Wildlife Biologists:** Zoologists and wildlife biologists study animals and other wildlife and how they interact with their ecosystems. They study the physical characteristics of animals, animal behaviors, and the impacts humans have on wildlife and natural habitats. <https://www.bls.gov/ooh/life-physical-and-social-science/zoologists-and-wildlife-biologists.htm>

| Quick Facts: Zoologists and Wildlife Biologists | |
|---|---------------------------------------|
| 2016 Median Pay | \$60,520 per year \$29.10 per hour |
| Typical Entry-Level Education | Bachelor's degree |
| Work Experience in a Related Occupation | None |
| On-the-job Training | None |
| Number of Jobs, 2016 | 19,400 |
| Job Outlook, 2016-26 | 8% (As fast as average) |
| Employment Change, 2016-26 | 1,500 |

- 3. Microbiologists:** Microbiologists study microorganisms such as bacteria, viruses, algae, fungi, and some types of parasites. They try to understand how these organisms live, grow, and interact with their environments. <https://www.bls.gov/ooh/life-physical-and-social-science/microbiologists.htm>

| Quick Facts: Microbiologists | |
|---|---------------------------------------|
| 2016 Median Pay | \$66,850 per year \$32.14 per hour |
| Typical Entry-Level Education | Bachelor's degree |
| Work Experience in a Related Occupation | None |
| On-the-job Training | None |
| Number of Jobs, 2016 | 23,200 |
| Job Outlook, 2016-26 | 8% (As fast as average) |

| Quick Facts: Microbiologists | |
|--|-------|
| Employment Change, 2016-26 | 1,900 |

- 4. Forensic Science Technicians:** Forensic science technicians aid criminal investigations by collecting and analyzing evidence. Many technicians specialize in various types of laboratory analysis. <https://www.bls.gov/ooh/life-physical-and-social-science/forensic-science-technicians.htm>

| Quick Facts: Forensic Science Technicians | |
|---|---------------------------------------|
| 2016 Median Pay | \$56,750 per year \$27.29 per hour |
| Typical Entry-Level Education | Bachelor's degree |
| Work Experience in a Related Occupation | None |
| On-the-job Training | Moderate-term on-the-job training |
| Number of Jobs, 2016 | 15,400 |
| Job Outlook, 2016-26 | 17% (Much faster than average) |
| Employment Change, 2016-26 | 2,600 |

- 5. Environmental Scientists and Specialists:** Environmental scientists and specialists use their knowledge of the natural sciences to protect the environment and human health. They may clean up polluted areas, advise policymakers, or work with industry to reduce waste. <https://www.bls.gov/ooh/life-physical-and-social-science/environmental-scientists-and-specialists.htm>

| Quick Facts: Environmental Scientists and Specialists | |
|--|---------------------------------------|
| 2016 Median Pay | \$68,910 per year \$33.13 per hour |
| Typical Entry-Level Education | Bachelor's degree |
| Work Experience in a Related Occupation | None |
| On-the-job Training | None |
| Number of Jobs, 2016 | 89,500 |
| Job Outlook, 2016-26 | 11% (Faster than average) |
| Employment Change, 2016-26 | 9,900 |

- 6. Agricultural and Food Science Technicians:** Agricultural and food science technicians assist agricultural and food scientists by performing duties such as measuring and analyzing the quality of food and agricultural products. <https://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-science-technicians.htm>

| Quick Facts: Agricultural and Food Science Technicians | |
|---|---------------------------------------|
| 2016 Median Pay | \$37,550 per year \$18.05 per hour |
| Typical Entry-Level Education | Associate's degree |
| Work Experience in a Related Occupation | None |
| On-the-job Training | Moderate-term on-the-job training |
| Number of Jobs, 2016 | 27,500 |
| Job Outlook, 2016-26 | 6% (As fast as average) |
| Employment Change, 2016-26 | 1,700 |

- 7. Agriculture and Food Scientists:** Agricultural and food scientists research ways to improve the efficiency and safety of agricultural establishments and products.

<https://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-scientists.htm>

| Quick Facts: Agricultural and Food Scientists | |
|---|---------------------------------------|
| 2016 Median Pay | \$62,920 per year \$30.25 per hour |
| Typical Entry-Level Education | Bachelor's degree |
| Work Experience in a Related Occupation | None |
| On-the-job Training | None |
| Number of Jobs, 2016 | 43,000 |
| Job Outlook, 2016-26 | 7% (As fast as average) |
| Employment Change, 2016-26 | 3,100 |

8. Occupational Employment and Wages, May 2016

19-1029 Biological Scientists, All Other

All biological scientists not listed separately.

[National estimates for this occupation](#)

[Industry profile for this occupation](#)

[Geographic profile for this occupation](#)

National estimates for this occupation: [Top](#)

Employment estimate and mean wage estimates for this occupation:

| Employment (1) | Employment RSE (3) | Mean hourly wage | Mean annual wage (2) | Wage RSE (3) |
|-----------------------|---------------------------|-------------------------|-----------------------------|---------------------|
| 35,110 | 3.1 % | \$37.42 | \$77,830 | 1.3 % |

Percentile wage estimates for this occupation:

| Percentile | 10% | 25% | 50% (Median) | 75% | 90% |
|---------------------------------|----------|----------|-----------------|----------|-----------|
| Hourly Wage | \$20.21 | \$26.72 | \$35.96 | \$44.00 | \$56.09 |
| Annual Wage (2) | \$42,040 | \$55,570 | \$74,790 | \$91,520 | \$116,680 |

Industry profile for this occupation: [Top](#)

Industries with the highest published employment and wages for this occupation are provided. For a list of all industries with employment in this occupation, see the [Create Customized Tables](#) function.

Industries with the highest levels of employment in this occupation:

| Industry | Employment (1) | Percent of industry employment | Hourly mean wage | Annual mean wage (2) |
|---|-----------------------------------|--------------------------------------|---------------------|--|
| Federal Executive Branch (OES Designation) | 16,480 | 0.81 | \$38.38 | \$79,830 |
| Scientific Research and Development Services | 6,250 | 0.93 | \$41.54 | \$86,400 |
| Colleges, Universities, and Professional Schools | 5,710 | 0.19 | \$28.31 | \$58,880 |
| Management, Scientific, and Technical Consulting Services | 1,090 | 0.08 | \$47.31 | \$98,400 |
| Pharmaceutical and Medicine Manufacturing | 1,070 | 0.38 | \$43.54 | \$90,550 |

Industries with the highest concentration of employment in this occupation:

| Industry | Employment (1) | Percent of industry employment | Hourly mean wage | Annual mean wage (2) |
|--|-----------------------------------|--------------------------------------|---------------------|--|
| Scientific Research and Development Services | 6,250 | 0.93 | \$41.54 | \$86,400 |
| Federal Executive Branch (OES Designation) | 16,480 | 0.81 | \$38.38 | \$79,830 |
| Pharmaceutical and Medicine Manufacturing | 1,070 | 0.38 | \$43.54 | \$90,550 |
| Medical and Diagnostic Laboratories | 560 | 0.21 | \$33.71 | \$70,130 |
| Colleges, Universities, and Professional Schools | 5,710 | 0.19 | \$28.31 | \$58,880 |

Top paying industries for this occupation:

| Industry | Employment (1) | Percent of industry employment | Hourly mean wage | Annual mean wage (2) |
|---|---------------------------|---|-----------------------------|-------------------------------------|
| Support Activities for Animal Production | 40 | 0.12 | \$48.44 | \$100,760 |
| Management, Scientific, and Technical Consulting Services | 1,090 | 0.08 | \$47.31 | \$98,400 |
| Employment Services | 310 | 0.01 | \$45.55 | \$94,740 |
| Offices of Physicians | 120 | (7) | \$44.06 | \$91,650 |
| Pharmaceutical and Medicine Manufacturing | 1,070 | 0.38 | \$43.54 | \$90,550 |

8.0: FISCAL RESOURCE REQUESTS/ADJUSTMENTS

8.1: BUDGET REQUESTS/ADJUSTMENTS

Based on program data review, planning and development for student success, programs will complete the budget worksheets to identify proposed resource needs and adjustments. These worksheets will be available in October. (See Resource G for more details on possible items to include.)

Narrative:

Biology Budget (2016-2017 Academic term)
For the Twelve Months Ending Friday, June 30, 2017

| | Published Budget | Operating Budget | Expense | Encumbered |
|-------------------------|-------------------------------------|------------------|-------------------|------------|
| Fund 11 Expenses | | | | |
| Salary: | | | | |
| 11-1176-520-000 | Faculty Salaries: Full-Time Faculty | | 109,105.00 | |
| 11-1176-521-000 | Faculty Salaries: Overload | | 11,000.00 | |
| 11-1176-522-000 | Faculty Salaries: Adjunct | | 10,175.01 | |
| 11-1176-530-000 | Clerical/Staff: Salary NonExempt | | 8,276.25 | |
| | Total Salary | | 138,556.26 | |
| Fringe Benefits: | | | | |
| 11-1176-591-000 | FICA (Social Security, Medicare) | | 9,425.92 | |
| 11-1176-594-000 | Insurance Premiums | | 23,447.44 | |
| | Total Fringe Benefits | | 32,873.36 | |
| Instructional Supplies: | | | | |
| 11-1176-700-000 | Instructional Supplies | | 3,536.00 | |
| | Total Instructional Supplies | | 3,536.00 | |
| | Total | | 174,965.62 | |

Budget request for teaching biology labs, equipment maintenance, professional development, and a part-time lab assistant for the upcoming academic year (2018 – 2019):

Following is the requested budget for the upcoming academic year (2018-2019) broken down according to different laboratory courses:

A. Instructional supplies:

Biology I for majors: \$600

Biology II for majors: \$1000

Microbiology: \$1000

A & P: \$1000

General Biology for non-majors: \$400

Nutrition: \$0

Total for Instructional supplies: \$4000

B. Equipment and Microscope Maintenance:

Microscope servicing: \$1200

Total for maintenance: \$1200

C. Professional development for two full time faculty:

1. Annual membership dues for American Society for Microbiology (ASM): \$50
Cost for attending Annual ASM conference for Undergraduate Education: \$2300
2. Anticipated budget: \$1500

Total for faculty professional development: \$3850

D. Biology Lab Assistant: There is always a need for a part time lab assistant (10 hours per week) to help prepare various solutions in the lab, setting up and cleaning the lab, maintaining the chemical inventory in the lab and maintaining the lab prep rooms.

Ten hours per week for 30 weeks (From Aug 15 - Dec 15 and Jan 15 - May 15): \$3000

Total requested budget for the above categories (A -D): \$12,050

Few other important points to consider:

1. In our previous program review (2014) we requested installation of a fume hood or a powerful exhaust system in AC 201 where Anatomy & Physiology is taught. Traditionally, in this class a cat dissection and lots of organ dissections are done. Cats and organs are preserved in propylene and 1% formaldehyde and it is strongly advised to do any dissections in a room with powerful exhaust and/or ventilation adequate enough to remove all the fumes. Fume hood is also considered an essential component of any biological lab. Due to the lack of any exhaust or fume hood in AC 201, cat dissection has been stopped since then and students are not learning it in the class.
2. We would propose moving the one extra fume hood in AC 203 to AC 201 so that cat and or other dissections can be resumed in Anatomy & Physiology class. A maintenance ticket was submitted to move the fume hood and we are told that it must go in the building improvement program. To sum it up, there is still no fume hood in AC 201.
3. Ideally, we would like to purchase a Anatomage table alpha virtual dissection system for in-class virtual dissection. It costs about \$50,000.
4. Due to the safety concerns, we would like to have a safety glass installed for the windows in the autoclave room. This was initially requested in the 2014 program review too.

9.0 PROGRAM PLANNING AND DEVELOPMENT PARTICIPATION

9.1: FACULTY AND STAFF

In this section programs will provide a brief narrative of how faculty and staff participated in the program review, planning and development process.

Narrative:

The two full time faculty members collaborated in planning, analyzing the data, and preparing this program review. The student enrollment data was provided by the office of institutional research and the budget data was provided by the Office of the controller.

9.2: DEAN AND/OR ADMINISTRATIVE DESIGNEE RESPONSE

After review and reflection of the program review, planning and development, the Division Dean will complete Dean's Summative Assessment form. The Dean's response will be available to programs for review and discussion prior to beginning the next annual planning and development cycle.

Narrative:

I agree with contents of this report. However, given ICC's current budget issues the Anatomage table alpha virtual dissection system seems out of reach unless there is a grant that would apply. Brian Southworth STEMB Division Chair. 2.15.2018